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DIESEL RAILWAY TRACTION

The April issue of this RAILWAY GAZETTE *Publication, illustrating and describing developments in Diesel Railway Traction, is now ready, price* 2s.

Transport Administration in Tropical Dependencies

By George W. O. Bulkeley, C.B.E., M.I.Mech.E.
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Priorities for the Allocation of Steel Supplies

PRIORITIES for the allocation of steel supplies have been fixed by the Cabinet, and, as was generally expected, electricity generating plant for electricity undertakings and machinery and equipment for coal production take first two places respectively. Third place is given to plant and equipment for gas undertakings, and this is followed by equipment for the coal-oil conversion programme. Presumably this fourth category includes work in connection with the conversion of steam locomotives to oil firing, progress on which has been slow, largely because of the difficulty of securing materials for the equipment. Only fifth place in the list of priorities is given to freight locomotives and railway wagons for the transport of coal, and steel rails for essential maintenance of permanent way. Lastly, atomic energy is listed. It is believed that inclusion of products within the six classes will ensure supplies of steel within reasonable limits. It is expected that a further list, covering the principal exporting industries, will be decided later, and that their needs will have to be met from the remaining annual production of steel.

* * * *

The "C" Licence Concession and Road Hauliers

When Mr. Roger W. Sewill, Director of the Road Haulage Association, addressed the annual dinner of the Redhill Sub-Area of the Association, he dealt bluntly with the concession made by the Government in respect of "C" licences during the Committee stage of the Transport Bill. He said that the exclusion of "C" licensees from the Bill did not amount to much. It gave to the co-operative societies and the multiple stores a weapon with which they could compete with the smaller traders more than ever before. They had unlimited radius of operation, whereas the small shopkeeper who could not afford to run his own lorry and depended on a haulage contractor, found that he was limited to 25 miles. The Government, which had professed to be the supporter of the "small man," was building up a colossal State monopoly which nobody imagined would be other than grossly inefficient, and it was giving freedom to existing monopolies in this country to operate against the small trader; the vast majority of traders would be worse off, because of the pressure of those intimately concerned with the Government, and who supply an immense part of the Government's funds—namely, the co-operative societies.

* * * *

British Investments in Brazil

The total amount of British investments in Brazil in 1946, according to statistics prepared by *The South American Journal*, was £191,667,170, or considerably less than the £221,094,796 at the end of 1945. The interest received totalled £7,734,119, or 4 per cent., which compares with £8,537,618, or 3·9 per cent. in 1945. The amount on which no interest was received fell from £27,718,241 to £25,133,690. The fall in the amount outstanding was the result of the substantial debt redemption, and the reduction of the nominal value of Government bonds brought about by arrangements entered into between the bondholders and the Government. In the statistics relating to British investments in the Brazilian railways, the amount of capital is shown as £31,605,505, compared with £30,726,662, and the interest received was £644,680, or 2 per cent., against £666,253, or 2·1 per cent. in 1945. The total of capital which received no remuneration last year was £19,484,279, compared with £18,532,336 in the year earlier.

* * * *

Restoring the Greek Railway System

At the end of 1946, the sections of the Hellenic State Railways main line from Athens to Salonica on which traffic had been restored were still isolated from each other by stretches undergoing repair, or used only by construction trains. A recent survey of the transport situation in Europe, issued by the European Central Inland Transport Organisation, showed that the longest continuous section of this line then operating was that from Athens to Gravia, with the branch to Chalkis (136 miles in all). Further north on this route, trains were running between Domokos and Larissa (37 miles), but although repairs were completed from Kolindros-Avinion to Katerini, operations on this section were confined

to the transport of materials for the restoration between Katerini and Larissa. Priority is being given to re-opening the branch from this line at Axios to the Jugoslav frontier at Idhomeni, to avoid a detour through Bulgaria for traffic from Salonica to Jugoslavia. The longest continuous sections of standard-gauge railway opened by the end of 1946 were from Salonica to Alexandropolis, connecting with the Franco-Hellenic lines to Turkey and Bulgaria, and providing a through route of over 380 miles.

* * * *

The American Railroad Dollar

On a number of occasions we have referred to the publicity given in Canada and the U.S.A. to the way in which railway receipts are used, and what a small proportion is available for distribution to stockholders. An advertisement of the Association of American Railroads now has been published giving details based on the returns for the calendar year 1946. These show that 51·5 cents of every dollar went to railway employees in wages and salaries; 33 cents were expended for materials, fuel, and other supplies; and 6·2 cents were paid in Federal, State, and local government taxes, which, of course, are used to maintain roads, police, schools, fire protection, and other public services, but none on railway tracks or terminals. On the investment side, 6·6 cents were paid as interest on loans, and the advertisement points out that a large proportion of railway bonds is held by insurance companies and savings banks, and thus represents the savings of millions of Americans. The U.S.A. railways had left only 2·7 cents out of which to pay for improvements to the properties and declare any dividends to the stockholders.

* * * *

Home Railway Traffic Receipts

The latest return of traffic receipts of the four main-line railway companies and the London Passenger Transport Board covers the four weeks to March 23, and reflects the after effects of the fuel crisis. Merchandise revenue was lower by £3,162,000 at £5,403,000. Passenger receipts declined £1,104,000 to £12,210,000. Takings from coal and coke movements were up £299,000 at £4,137,000. The table below summarises the position for the four weeks and also for the 12 weeks of the year:—

FOUR WEEKS ENDED MARCH 23, 1947

	1947	1946	+ or −	Per cent.
	£000	£000	£000	+ or −
Passenger ...	12,210	13,314	−1,104	− 8·3
Merchandise ...	5,403	8,565	−3,162	−36·9
Coal and coke ...	4,137	3,838	+ 299	+ 7·8
Total ...	21,750	25,717	−3,967	−15·4

AGGREGATE FOR 12 WEEKS OF THE YEAR

	1947	1946	+ or −	Per cent.
	£000	£000	£000	+ or −
Passenger ...	35,894	39,719	−3,825	− 9·6
Merchandise ...	18,342	24,606	−6,264	−25·4
Coal and coke ...	12,016	11,016	+1,000	+ 9·1
Total ...	66,252	75,341	−9,089	−12·1

So far, total receipts are lower by over £9,000,000, or more than 12 per cent.; the greatest fall in aggregate and percentage is shown by merchandise revenue, which, at £18,342,000, shows a decline of £6,264,000, or nearly a quarter compared with a year ago.

* * * *

Medical Welfare on the S.N.C.F.

For many years, the French National Railways Company has attached great importance to medical welfare, and elsewhere in this issue appears an article describing a new radiological train recently completed for the Northern Region of the S.N.C.F., replacing a former train damaged in an air raid on the La Chapelle sidings in 1944. By means of this train, equipped with modern X-ray apparatus, it will be possible to conduct systematic mass examinations with a view to the prevention of tuberculosis, and this medical benefit now can be extended to employees living in small communities where there is no qualified lung specialist. This arrangement will supplement the work carried out continuously at the existing eight tuberculosis centres of the Northern Region, and will ensure that all employees and also their families are examined at least once every year. Valuable though this work is, the company, bearing in mind the general poor standard of health today, is anxious that the prevention of tuberculosis shall not be the only object of its mobile medical service, and it is proposed in future to carry out on each subject a thorough examination of the whole body; for this purpose a further coach will be added.

* * * *

Re-Rolling Railway Rails

There are various uses for railway rails after they have been removed from the track. If their condition is still reasonably good, though no longer up to main-line standard, they can be re-laid in subsidiary running lines or sidings. A second use is to turn them over to re-rollers. Only when they are badly worn or corroded is there no alternative but to dispose of them as scrap. In the United States, where the average of rail displaced in relaying operations for the past 18 years has been 1,101,000 tons annually, almost half the total has been disposed of to steel mills, and out of this an average of 418,000 tons has been re-rolled. Rail steel, with a tensile strength and stiffness about 50 per cent. greater than that of mild steel, has many uses when re-rolled. In the United States, these include rounds for reinforcing concrete, brake-beams, stiffeners, fences, gates, and sign-posts, ladders and hand rails for box wagons, and so on. The rails bought for re-rolling are to strict requirements as to straightness, cross-section, length, and general uniformity, and have to pass an inspection in which any defective rails are rejected. After heating in soaking pits, they are split into head, web, and foot, and each part is re-rolled into some different type of bar or section, after which the products are annealed, cut to length, and straightened. The demand for these re-rolled products is considerable.

* * * *

Telescopic Rates Experiment in India

The ambition of every reformer of existing systems of goods rates is to get rid of exceptional quotations. That was the aim of the advocates of the revised classification of merchandise which the British railways adopted in 1928. In that case, the attempt to pick up exceptional rates by increasing from 18 to 21 the number of classes to which goods were assigned, missed fire, and our railways have more special quotations than ever. We wonder whether better luck will attend the effort of the Indian railways to adopt a telescopic scale of rates for manures, oilcake, and bonemeal (for manure). This experiment, described elsewhere in this issue, will be worth watching. The principles followed in preparing a special class " A " scale for these traffics seem sound, apart from the decision to have a blanket rate applying to all movements in excess of 1,500 miles. On a cost-of-working basis, the same charge for a transit of 2,000 miles as for 1,500 cannot be justified. In practice the question may not arise, but it would be safer to continue this scale, and any similar scales, on a tapering basis instead of prescribing a maximum rate applicable at and beyond a specified distance for each commodity. It is impracticable to finesse all the anomalies which may occur through ignoring the extra cost of working over long distances.

* * * *

Power Cars for Train Lighting and Heating

A new use for diesel-electric power on trains is proposed by Mr. J. D. Loftis, General Superintendent of Motive Power, Atlantic Coast Line, U.S.A., in a recent issue of the *Railway Age*. The electrical demand on the modern American train for lighting, water cooling, ventilation, and particularly for air conditioning, is becoming so great that it is outstripping the capacity of the 20 kW. axle-driven generators hitherto fitted to American coaching stock, and new types of 25 and 30 kW. generators are being designed. But the maintenance of axle-driven generators, due to their position under the coaches, exposed to dust and dirt, is heavy, as also is that of steam-heating equipment. Mr. Loftis, therefore, proposes the addition of long-distance trains of independent power cars, with diesel-driven generators supplying all current required for lighting, air conditioning, coach heating, as well as for cooking, refrigeration, coffee urns, toasters, and all other culinary purposes in the restaurant cars. He calculates that the needs of an 18-car train of lengthy American coaches would require for their supply a 2,000 b.h.p. diesel plant with an attendant. Against the additional weight could be set the

elimination of the friction of the existing axle-driven generators; against the wages of the attendant and the maintenance of the power car (the latter $9,000 per annum) could be set the elimination of maintenance of generators and steam-heating equipment throughout the train, or about $42,000 annually in a train of 18 coaches. If the train were diesel hauled, the 2,000 b.h.p. of the power car would be additional to the 4,000 b.h.p. needed for traction.

* * * *

L.N.E.R. Commercial School at Darlington

Elsewhere in this issue we give an account of the work of the L.N.E.R. Commercial School at Darlington. The main object of this school, which was opened nearly a year ago with Mr. H. F. Sanderson as Principal, is to provide courses of instruction in the more advanced stages of railway commercial work. The syllabus covers a very wide field, from the historical development of railways and their organisation to subjects of general interest such as office methods and the selection and training of staff. Students are encouraged to broaden their outlook on railway affairs generally, obtaining in this way a better appreciation of the requirements of the public and industry; the practical work of the course, although limited, includes several exercises in connection with private sidings facilities. It is gratifying to learn that the amenities of the school, which is run on residential lines, are greatly appreciated by the students, and that the general atmosphere is such that already a tradition has been built up which it is hoped will be maintained and strengthened in future years. That the students find the course strenuous is hardly surprising, bearing in mind the scope of the subjects covered in the short time available—only 4½ weeks—but if they leave the school with a better understanding of railway problems, the weeks spent at Faverdale Hall will have been well worth while.

* * * *

A French Tribute to the Swiss Railways

Our contemporary, *Chemins de fer*, the organ of the Association Française des Amis des Chemins de fer, has issued a special number devoted to the railways of Switzerland. The text is by M. André Gache, who made a tour of inspection there and has recorded his experiences in an excellent manner. Most aspects of the working are discussed, and much well-deserved praise is bestowed on those who have brought the Swiss railway system, equally in its publicly and privately-owned portions, to its present forward state of development. Considerable attention is paid to electrification, which now has spread to almost all routes, and to the perfecting of the single-phase system in which Swiss industry has played so conspicuous a part. Although there are those who, for understandable reasons, feel a genuine regret at the disappearance of the steam locomotive, the history of which in Switzerland is itself a fascinating story, M. Gache stresses the fact that nowhere did he meet a single real opponent of electrification, while he qualifies as "simply ridiculous" any suggestion that the wisdom of converting, say, the Gotthard route now could be questioned.

* * * *

The Nogent Viaduct Restored

A vulnerable link in the former French Eastern Railway's main line from Paris to Mulhouse was the well-known viaduct over the Marne valley between Nogent-le-Perreux and Villiers-sur-Marne Stations, 830 metres (908 yd.) long. As the line represented a very important route between the capital and the eastern provinces on the Rhine, the retreating Germans sought to make it as unserviceable as possible, and in August, 1944, destroyed four arches, leaving a 238-yd. gap. Faced with the necessity of rebuilding completely, the French National Railways authorities decided on a reinforced-concrete structure of three equal arches, which now, after over a million man-hours of work, has been brought into use. It is interesting to note that during a critical period of the 1914-18 war, traffic was so intense as to call for a block signalling post on the viaduct; and that that led the Eastern company to instal its first section of automatic signalling and to extend the track circuiting progressively until the whole of its main lines had been equipped, making it the leading Continental railway in that field, and exercising much influence on future practice in France.

Transport Bill and Rating of Railways

ON a superficial reading of the Transport Bill it may seem that local authorities are adequately protected so far as rate contributions in relation to railways are concerned. If railways became Crown properties they would be exempt from any legal liability to pay rates, in the absence of any special statutory provisions to the contrary, although *ex gratia* contributions in aid of rates in respect of hereditaments occupied by, or on behalf of, the Crown for public purposes might be made, the amount of such contributions being determined by the Treasury Valuer. The status of nationalised industries is not too clear. The Minister of Fuel & Power informed the House of Commons recently that the National Coal Board was a commercial undertaking with no obligation to furnish information to the House. Will the British Transport Commission come within the same category if the Transport Bill is passed?

The Coal Industry Nationalisation Act, 1946, provides that nothing in the Act is to be deemed to exempt the National Coal Board from liability for any tax, duty, rate, levy, or other charge whatsoever, whether general or local. The effect of this seems to leave the rating of all collieries and hereditaments which become vested in the National Coal Board in the same position, so far as liability for local rates is concerned, as before the nationalisation of the coal industry. A similarly worded clause has been incorporated in the Transport Bill, which covers other than railway properties.

It would appear that by making a special reference to the Railways (Valuation for Rating) Act, 1930, the Transport Bill purports to safeguard the position by applying the 1930 Act to the Commission in respect of the railway undertakings and the portion of the London Passenger Transport Board hitherto dealt with thereunder. The Bill does not reveal whether it is intended for rating purposes to maintain as separate entities the undertakings now forming the four main-line companies or the nature of the adaptations and modifications mentioned in the Bill likely to be covered by Ministerial regulations so far as the 1930 Act is concerned. Presumably, this will not authorise an alteration of the principles of the 1930 Act as interpreted by the courts. It is possible, therefore, to test the position in relation to local rates under the provisions of the Transport Bill only by a consideration of the overall picture on an aggregate basis, disregarding the disturbing factor that the railway-owned docks will not be within the jurisdiction of the Railway Executive to be set up under the Bill, but will be embraced within the Docks & Inland Waterways Executive.

Shortly, the assessments on which the rate payments are calculated arise from net receipts reduced by a tenant's allowance to arrive at a net annual value. Thus, with the knowledge of net receipts of about £43 millions during control the Government was able to pass the Railways (Valuation for Rating) Act, 1946, which stipulated net annual values of the undertakings of the four main-line companies and the London Passenger Transport Board of approximately £7,800,000.

The Bill provides that the Commission shall so conduct its undertaking that the revenue is not less than sufficient for meeting proper revenue charges, taking one year with another. The Government has made it clear that the stock to be issued in exchange for railway holdings will attract about £17½ millions less in interest than was paid under the Control Agreement. According to the Minister of Transport, the Commission will be charged *first* with the responsibility of paying its way, and so far as the railway section of the Commission's undertaking is concerned, a figure of approximately £25 millions thus will be the difference between revenue and expenditure.

The Chancellor of the Exchequer has explained in the House of Commons that it will be only in the event of the Commission being in default that the Treasury guarantee will come into operation. Thus, the £25 millions will constitute the net receipts from which the revised net annual value must be deduced. Unless the Courts' decision in the Southern Railway case, which was the subject of the most detailed investigation up to the House of Lords, is to be ignored completely, the deduction for tenant's share will not be varied materially and may absorb the £25 millions, and thus no assessment could be established. It may be, however, that the rating authorities will put forward an argument on what the Minister of Trans-

port has described as the " right of the State to benefit from the use of its own credit " to reduce the recognised tenant's allowance, on the ground of greater security, to increase the assessments against the Commission.

A compromise, however, might be assumed on the basis of an assessment of a similar percentage of net receipts as prevails under the 1946 Act, which, although illogical from a rating point of view, would give a new net annual value of about £4½ millions. It may be that a reduction of approximately £3¼ millions in net annual revenue is not a matter of great concern to rating authorities as a whole, although hitherto it has been strongly urged in some quarters that the assessments were far too small. There are parishes where the railway rate payments represent a substantial proportion of the total rates raised, and it may be considered that under a unified system of railway operation there no longer may be any justification for following the practice of allowing the incidence of rates to fall unevenly, and basing assessments on the L.N.E.R. and L.M.S.R. systems at about 15 per cent. of the net receipts and on the G.W.R. and Southern Railway systems at approximately 70 per cent. in excess. This may cause some concern as to whether the unfair compensation terms which the Ecclesiastical Commissioners say will deplete their annual income to the extent of more than £150,000 and lessen the stipends of the poorly-paid Welsh clergy by £20 a year, as well as causing hardship in the railway stockholding community, may not also impose on a large number of ratepayers an obligation to pay increased rates to make good the railway rate deficiency.

Although the London County Council has expressed the view that properties occupied by the Crown should be made rateable and valued for that purpose on the same basis, and in the same manner, as other property, and has decided to join with associations of local authorities in a deputation to the Chancellor of the Exchequer and the Minister of Health to urge that effect should be given to this proposal, it may be that, had provision been made for dealing with the matter on the basis of a contribution *in lieu* of rates on account of a Government ownership and occupation, it might have been difficult to have resisted rate payments at least equal to those now subsisting. Does the Bill, with great wisdom, make the rating authorities a present of the 1930 Act which may, in the circumstances, mean nothing?

It is true that the rate liability is fixed until March 31, 1951, but the problem is not made easier because it is deferred for a few years. Things will have settled down—or blown up—by 1951, and there will always be the 1946 Act figures to fall back on in the event of insuperable difficulties in determining net annual values.

* * * *

The Officering of Indian Railways

THE figures given in the editorial article on " Indianisation " in our March 21 issue showing a reduction on the railways of India in European officers between 1939 and 1945 from 61 per cent. to 33 per cent. are sufficiently striking, but, as a correspondent points out, in March, 1945, there was a very considerable number of officers retained in service " on extension " beyond the normal retiring age of 55, to meet the various exigencies of war conditions. Without these, the 1945 European percentages would have been appreciably lower than 33. Those officers on extended service have all gone now, and officers are retiring at their normal times. It has been calculated that the number of Europeans in active service in the Indian gazetted grades at the end of 1947 will not greatly exceed 200, or about 12 per cent.

This rapid reduction in the number of European officers really is nothing to do with the change of Government at present in progress in India. The causes go back much further, over 20 years, to the time when the Indian Government decided that from 1927 onwards only 25 per cent. of officers recruited to Indian Railways should be European. This percentage, theoretically, was worked to until 1939, but the introduction in 1934 of the " Revised Scales of Pay " made service in India comparatively unattractive, and in practice the European quota was not altogether filled in the five years before the war. From 1939, European recruitment practically has ceased, because of the requirements of manpower for national service.

For the future, the Interim Government has made the position quite clear. It wants all European officers at present in service to complete their normal term, and has promised to continue their present scales of pay and conditions of service. But no Europeans will be appointed, except, perhaps, a few specialists who may be engaged for limited periods on special contracts. India, therefore, is now, to all intents and purposes, closed as a country in which European railway officers may hope for a career.

In view of this, the number of appointments of European officers to senior positions as General Managers, or Principal Officers, as recorded from time to time in our columns, may cause some surprise. This is not very surprising, when it is realised that officers now being selected to these key positions all date the commencement of their service before 1927. The dwindling number of Europeans still left is, therefore, mainly in the more senior positons. This will probably change fairly completely in the next five years, by which time certainly most of the more senior posts will be filled by Indian officers.

As far as subordinates are concerned, little or no recruitment of Europeans of non-Asiatic domicile has taken place for several years, and this type of subordinate probably will disappear altogether before long. It is, however, to be hoped that the present Anglo-Indian percentage will be maintained. Throughout the history of Indian railways, the Anglo-Indian community has made an invaluable contribution to the service, particularly amongst the running staff, and it is greatly in the interests of efficiency that this state of affairs should continue.

* * * *

Railway and Airline Rivalry in the U.S.A.

THERE is no doubt that the United States is throwing tremendous energy into after-war developments despite labour troubles and other hindrances. As one result of this forward drive, air transport is expanding at a rate which leads some enthusiasts to imagine that the American railways will soon lose much of their passenger business. With its vast distances and its great numbers of wealthy persons, prone to spend money on travel and eager to move rapidly from one scene to another, America offers great scope for the spread of civil aviation. It is, however, important to preserve a sense of proportion in regard to the effect of air competition on railway carryings, and the best way of doing so is to compare the traffic statistics of the two forms of transport. Through the courtesy of the British Railway Research Service, we are able to give details of the performance of the American airlines during the five months ended May 31, 1946, as contrasted with the corresponding period of 1945.

During the five months in question, 2,022,243,000 revenue passenger-miles were flown, an increase of 76 per cent. on 1945. The percentage advance looks impressive, but it has to be borne in mind that the total passenger-miles, 4,230,428,000, flown during the 12 months ended May 31 last were less than 5 per cent. of the 91,745,000,000 passenger-miles worked by the U.S.A. railways in 1945. The airlines are still in the early stages of progress, but their services are being consolidated and have become dependable. In the first five months of this year, 95 per cent. of the scheduled flying mileage was accomplished and 88 per cent. of the available seats in the planes were occupied. During the same period, express ton-miles at 10,973,000 represented an increase of 12 per cent. on 1945, but mail ton-miles at 15,541,000 were 43 per cent. below last year's figures. Taking express and mails together, the airlines have not made headway as freight carriers, though on emergency they have proved valuable for the conveyance of articles such as machinery and spare parts. At the time of writing, the financial results of the air services to the end of May are not known. Some time ago, the Civil Aeronautics Board reported a loss of over a million dollars on all operations in January, but that may have been a lean month.

In the meantime, the railways are taking active steps to cope with their air rivals. Trains have been accelerated. New coaches of up-to-date design are being installed on a generous scale. Through sleeping-car services between the east and west coasts have been inaugurated. Above all, diesel-electric locomotives hauling streamline passenger vehicles are being introduced as fast as the builders can give delivery. *Diesel Railway Traction* for October recorded far-reaching developments on the Santa Fe and Chicago & North Western,

while even the Lehigh Valley, operating in a coal-mining area, is experimenting with diesel-electric power on its "Black Diamond" and "Maple Leaf" expresses. It is also reported that the Missouri-Kansas-Texas Railroad, which operates nearly 1,800 miles of line and owns 273 locomotives, has decided to institute diesel power for steam working entirely; in American journalese, "Katy goes diesel."

In the long run the measures which the railways are taking to improve passenger facilities may protect their earnings if the level of fares is low enough to attract the travelling public. The policy of the airlines has been to reduce their charges until some flights cost little, if anything, more than railway journeys between the same cities. This is a fine advertisement for air transport, but these charges are not on a commercial basis and would have to be raised substantially if the airlines had to bear the whole of their operating costs, as the railways do.

* * * *

Development of Locomotive Power at Speed

WE publish elsewhere in this issue an abridgment of a paper which Mr. E. L. Diamond presented recently to the Institution of Mechanical Engineers. His paper is particularly timely in view of recent trends in locomotive design. In general, the aims of the paper are, first, to demonstrate that, if simple expansion is adhered to, the gains in thermal efficiency to be reaped by increasing the boiler steam pressure gradually fall off after a pressure of about 250 lb. per sq. in. has been passed; indeed, a boiler pressure substantially higher than that figure fails to improve the thermal efficiency unless compound expansion is employed; second, the variation of mean pressure with speed of revolution is examined, and a simple exponential relationship is proposed so that, given the governing dimensions, the power of any locomotive can be estimated at any speed.

The author shows the uselessness of expecting substantially better results from a mere increase in boiler pressure; such a change demands improved valve events to enable full advantage to be taken of it. Incidentally, he makes out a good case for compound expansion, provided that reasonably high boiler pressures are permitted. To what extent this view is influenced by the author's earlier experiences, during the time of his practical training on the L.M.S.R., it is difficult to say, but he has had considerable experience with the 4-4-0 compounds, and has published papers on their cylinder performance.

The neat and careful method of presentation of the subject in this paper should not delude the reader into supposing it to be an academic exercise. The author is careful to define exactly the background against which all his ideas are worked out, and in the second part of the paper, perhaps the most interesting section is that devoted to the comparison of nine actual locomotive types, covering British, French, and American practice. The results are presented as a family of curves, and have the great merit of being on a truly comparative basis, since the ordinates are the mean effective pressures, expressed as percentages of the calculated mean effective pressures in each case.

In applying the paper to practical problems, one or two facts should be borne in mind. First, the paper covers only what is claimed in its full title—the development of locomotive power at speed, which the author defines at 250-400 r.p.m. Further, it presupposes that the locomotives in connection with which it is used are in reasonably good mechanical condition. The author makes particular mention of piston valve leakage as a great evil, and labels it "a principal factor" in the overriding effects of mechanical condition on steam consumption.

It is good to see David Kinnear Clark referred to as "that great English pioneer." The value of the rules laid down by him nearly 100 years ago for successful compound working remained forgotten for several decades until their value was put to practical proof by the Nord Company of France. It is also of interest to note that D. K. Clark also put forward a formula for mean effective pressure which was published in his treatise "Railway Machinery" more than sixty years before the formulæ of Cole and Kiesel. The original Clark equation, however, was rather different; it simply related the mean effective pressure (expressed as a percentage of the boiler pressure) to the percentage cut-off. It can, however, be modified to produce an expression giving results—over the greater part of the range of cut-offs used in practice—which are indistinguishable from those of the Kiesel formula, and, in fact, only breaks down at the absurd limits of 0 per cent. and 100 per cent. cut-off.

The paper should appeal to those locomotive engineers specially interested in the inter-relationship of cylinder design and performance, which even in the last few weeks has assumed a greater importance than before, in view of the increased need for higher efficiency and further economies in fuel. Such advantages can be gained from a better understanding of the effects of compression and clearance volume. The best relationship between cut-off and compression has an additional bearing on the matter, a point which the author might have pursued further. The only point in the theoretical treatment which seems open to question is the use of rotational speed instead of piston speed as a basis for the graphs. Piston strokes vary from 24 in. on the Ivatt 4-4-2s on the L.N.E.R. and "Merchant Navy" 4-6-2s on the Southern Railway, to 34 in. in the larger American locomotives, so that there is bound to be some effect due to this fundamental difference in design. It will be interesting to see whether Mr. Bulleid adopts an even shorter stroke in his double-bogie locomotives, the construction of which was authorised last year. In view of Churchward's undoubted genius as a designer—a fact freely acknowledged in Mr. Diamond's paper—it is something of a mystery why he used a long 30-in. stroke on so many of his designs. Yet the long-stroke engines of the "Saint" class and their successors have enjoyed a particularly distinguished reputation on the G.W.R., the reason for which may, indeed, be in the liberal clearance volume provided in conjunction with high steam pressure and long-travel valves.

* * * *

Problems of Glass in Signalling

ON December 18, 1946, members of the Institution of Railway Signal Engineers heard a non-member, an acknowledged authority on the manufacture and properties of glass, Mr. J. G. Holmes, address them, with special reference to the requirements of their own work. Although the construction of lamps and lenses, and the composition and hue of spectacle glasses, have been discussed often among signal engineers, the subject generally has gained additional significance during the last 20 years or so with the introduction and extension of colour-light signalling. In this, the manufacturers of lenses, reflectors, and electric lamps came together, and, by combining their knowledge and skill, ushered in a new era in visual signalling methods in railway and other transport fields.

It was inevitable, once the initial difficulties had been overcome and the practicability of using lights as signals in daytime had been established, that the new form of signalling should prove increasingly attractive, on account of its simplicity, ease of control, ready adaptation to the multiple-aspect principle, relative immunity from weather influences, and great advantage of presenting uniform aspects throughout the 24 hours. Therefore, although the light signal has disadvantages in some circumstances—leading a few American lines, for example, still to prefer the semaphore on certain single-line routes abounding in sharp curves—it is gradually displacing the older methods in most countries. The older problems, however, also remain. The mechanical type of signal will continue to exist for a long time, and probably oil lighting (in spite of a certain tendency to use electric). The question of the best shades for coloured glasses and the most satisfactory forms of lamp, with related problems, will remain of interest.

Although the uses of the various combinations of lenses, spreader, and other optical devices form the principal elements in light-signalling problems, as much importance can attach to the less noticeable ones of making stencil indicators and other subsidiary signs efficient under all conditions; thus, although the signal engineer is concerned with a relatively small part of the glass-manufacturing field, his requirements call for a high level of skill in it. Mr. Holmes's informative paper, together with his particularly comprehensive replies to questions, served not only to present a variety of scientific details, but also to emphasise how much our modern signalling systems owe to the investigators in a fascinating branch of physics and those who have embodied their achievements in practical designs.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

A Swiss View of the Transport Bill

London. March 6

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I have read with interest the reply of the Secretary of the Swiss Federal Railways to the article in your February 7 issue. I notice that he is completely silent on the question as to whether the railways are being run at a profit or a loss, although he makes a great point of the rates and fares having been raised only by 7 per cent., as against the increase in the cost of living of 50 per cent. since 1944. If, as is probable, the Swiss Railways still are being operated at a substantial loss, all that this means is that the railway traveller is being placed in a favourable position *vis-a-vis* the rest of the population, who have to make good the deficit by way of taxation.

Yours faithfully,

REALIST

Road and Rail Track Costs

Hill Top, Frith Hill,
Godalming, Surrey. March 31

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the editorial comments on road and rail track costs in your issue of March 28, you refer to my recent letter to *The Times* on the welcome release of the "C" licensee from the Transport Bill.

I think most people who have read my scheme as outlined in 1940 in "The Road and Rail Transport Problem" would agree that this goes a good deal further than the levying of tolls on road transport only. It is, however, of interest to note that, as far back as 1932, the principle of levying tolls on the roads based on payment by user was considered to be a practical possibility.

The machinery for doing this, and at the same time assuring a rate of structure for all forms of transport in general accord with Government policy, is one of the practical aspects of the problem of transport co-ordination which is not evaded by nationalisation so long as the "C" licensee is free.

An equalised user toll for each form of privately operated transport, including the "C" licensee, means that, in the long run, competitive rates will tend to vary by the differences between operating costs. Under complete nationalisation, rates similarly should be based on operating costs irrespective of the track cost of the different forms of transport—which have to be incurred whichever form is used. In the former case, the correct distribution of traffic is determined automatically by the free play of fair competition; in the latter case, any accurate determination of the rates which should be charged by the different forms of transport would demand a superhuman prescience of local traffic situations, and if the "C" licensee is free, there will be the same lack of scientific basis for a rate structure as at present.

One wonders how far the policy of transport charges under nationalisation has been worked out or even considered. There has been little guidance on the subject, which should be one of the main features of any reorganisation, and which vitally concerns all users.

Yours faithfully,

H. OSBORNE MANCE,
Brig.-General

American Passenger Equipment

Red Cottage, Townsend Avenue,
St. Albans. April 5

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—May I briefly comment on "East Anglian's" letter in your issue of March 28, as he seems to have misunderstood my previous remarks? I was concerned with long-distance travel only, and, therefore, his overall statistics of passenger traffic are hardly relevant. He seems also to infer that in citing "named" American trains, I was making an unfair comparison with British practice. But the great majority of express passenger trains in North America are named: I merely mentioned three in which I had travelled, and which were made up of equipment built shortly before America's entry into the war. There are many others like them, and as re-equipment proceeds, the number is increasing rapidly.

I was referring, moreover, to "coaches," the term specifically used in America for the cheapest type of accommodation and corresponding to third class in Britain. My object in suggesting that these might be used as a model for new British rolling stock was that the design appears to make better use of the available space.

A long journey here soon becomes irksome even in a first class compartment if there are six people in it, owing to cramped leg room, and to be one of eight in a third class compartment is thoroughly unpleasant. But an American "coach" fitted with the adjustable type of seat which is now becoming standard, and with all seats facing the same way, gives ample room even when fully occupied. These vehicles can hardly be described as "sumptuous" in their internal finish, which is simple, though in admirable taste. I doubt whether they would cost any more to build per seat than the present British designs. There is no reason, therefore, why "East Anglian" should not have austerity combined with considerable comfort.

Yours faithfully,

W. R. D. MANNING

Are Our Railways a Disgrace?

47, St. Michael's Avenue,
Bramhall, Cheshire. March 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—There is no greater authority on this side on Canadian railways than Mr. Thom of the C.N.R., and I have the greatest admiration for the efficiency of both Canadian railways. As I took my trains at random, it undoubtedly is possible to find faster ones. But I think his letter in your March 28 issue has underlined the fact that Canada is a country the size of Europe with 11 million people, whilst we have a dense population in a little island. Therefore, the Canadian, and parts of the U.S. services, are more thinly spread out than in our country, and therefore less frequent.

If we have more trains on our lines and branch lines, how can our railways be a disgrace? If they are not, are they being taken over on false premises?

Yours truly,

M. B. STOKER

Railway Electrification in Great Britain

Mersey Railway,
General Manager's Office,
Central Station,
Birkenhead. April 3

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—With reference to the letter of the anonymous correspondent, "Northern Heights," in your issue of March 21, the letter from Mr. Grasemann in the following week's issue appears to deal effectively with the points raised.

I quite agree with Mr. Grasemann's remarks, and the excellent service given by the Southern Railway during several weeks of exceptionally bad weather, when the electric services were interfered with seriously only on two days, seems to testify to the reliability of its system. It would appear that even better results would have been secured had it been possible to obtain all the materials required for the de-icing equipment.

Yours faithfully,

R. VARLEY,
General Manager & Engineer

London Railway Terminals and Nationalisation

Hurst Wickham,
Sussex. April 8

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—A property close to Cannon Street terminus sold recently for £180,000 freehold. At the same price per square yard, I worked out that Cannon Street Station would fetch £7,250,000, London Bridge Station £12,000,000, Victoria £15,000,000, Waterloo (24 acres) £37,000,000, and Charing Cross £4,000,000. Taking the outer termini, Paddington, Kings Cross, and the others at a lessened price per square yard, the total of London terminal stations amounted to £112,750,000.

Yours sincerely,

G. A. SEKON

HUNGERFORD FOOTBRIDGE CLOSED TEMPORARILY. — The Southern Railway announces that, on account of engineering works, the Hungerford Footbridge at Charing Cross was closed to the public on April 8, and will remain closed until June 9. By arrangement with the London County Council, the emergency bridge adjoining the County Hall will be open (daylight hours only) during this period; access is from York Road on the south side and the Victoria Embankment on the north side.

The Scrap Heap

The Platelayer

In a well-deserved tribute to the L.M.S.R. train crews who ran the Manchester-Euston train in the recent blizzard, no mention was made of the humble platelayer who was out in his hundreds keeping the points clear and safe. No cabin or cover for him, and the work is dangerous.—*From a letter in "The Evening News."*

* * *

Costs and Benefits

We who disbelieve in Socialism have always argued that in a socialised industry the costs of administration go up and the benefits of the consumer go down. Could we have a better example of this than our postal services? No 1939 ceiling for them! Increased telephone rentals have been consolidated (blessed word) in our half-yearly accounts. Postal charges of every kind have been increased, and late deliveries and collections abolished. In every case it is the consumer who pays and the State that turns its monopoly screw.—*Mr. Raglan Somerset in a letter to the "Manchester Guardian."*

* * *

"Atrocious" Train Lunch

Dragooned as we have been by war's necessity in recent years, we now seem unable to fight back at all. Where is the spirit that once marked an Englishman?

To show that it does pay to question and to refuse to accept the second-rate, was proved to me in a train from the North of England the other day. A woman, with two children, complained about the atrocious lunch, and when the bill (11s. 9d.) was presented, she refused to pay it. The conductor suggested that he wouldn't charge for the coffees (1s. 6d.). She refused to accept that. In the end he agreed to charge her for only two luncheons.

Telling the woman that she was courageous to argue in these days, I learned that she had just come from India. The one thing that staggers her, after having been out of the country for nine years, is the complacent, meek way British folk now accept everything (however bad it may be) that is given to them.—*H. H. H., in "The Evening News."*

* * *

100 YEARS AGO

From The Railway Times, *April* 10, 1847

RAILWAYS.—Capitalists who seek profitable investments unattended with risk, should act only upon the soundest information. Price seldom indicates the true value of Railway property. Hence we constantly observe some Shares as much above as others are below their real value, the market price of the day being ruled more by the present supply and demand, and the operations of speculators, than by any reference to the intrinsic merits of the property. The *bond fide* ultimate value of a Railway depends upon its cost, traffic, and expenditure; the probability of competition, or alliance with other Companies by lease, sale, or amalgamation; premiums on capital by the creation of new shares; and other causes wholly irrespective of the mere speculative feeling of the day. Calculations founded upon these considerations, show what shares at the current price of the day may be bought, sold, or exchanged with advantage.

The selection of that Stock which is the most eligible, requires data that can only be arrived at by those who give an undivided attention to the subject. To the minutest ingredients of value, we have directed a rigid and constant attention, and from our practical acquaintance with the Money Market, and from the experience of a long-established business, extending over two millions per annum, we believe ourselves competent to form a sound and valuable opinion.

Sales, purchases, and loans negotiated upon the best terms.

Dividends received without charge.

JAMES S. TRIPP and Co.
Lombard-streetChambers, Clement's-lane, London.

* * *

Main-Line Station Amenities

This morning the writer of this column had occasion to meet a night train from the North at a main London railway station. Arriving punctually at 6.30 a.m., he first learned that the train would be one hour late. So he asked a policeman to direct him to the buffet. The constable replied gloomily: "It's in there, but it doesn't open until seven."

Despite this sour prognostication, three wan girls opened the doors at 6.45. Instantly a queue of weary travellers, just off a night train, formed up in front of the tea urn. A large batch of cups was assembled and filled. A waitress mournfully rattled a sugar spoon over the serried cups.

This rite completed, the beverage was sold—at 3d. a cup, without saucer, spoon, or taste. Nor were the travellers even given the chance of a moment's rest as they swallowed this remarkable drink. The dingy buffet contained few seats, and the bookstalls were still closed, so the morning papers, then being distributed to every home in London, were not available.

At last the train arrived. Four hundred passengers jumped out. Four taxis awaited them. Some people humped their bags and disappeared into the Underground. Others, forlorn, hungry, and hopeless, remained at the station praying for arrival of more taxis.

The London public have suffered long enough. Let them arise and turn in their wrath against all those responsible for bad service, bad manners, and bad management. The thin strain of individual complaints needs to swell to a sonorous chorus of indignation. Some parts of Britain's capital need a Spring clean.—*From "The Evening Standard."*

* * *

Government P.R.Os

Before the war, the Dominions and Colonial Offices had two public relations officers between them, and their combined cost was £1,050 a year. This has happened since:—

P.R.Os now employed by the Dominions Office	27
Cost this year	£25,916
P.R.Os employed by Colonial Office	19
Cost this year	£17,189

Today, with India nearly out of the Empire, there are nearly three times as many P.R.Os employed by the India Office as in the days when India's affairs were the prime responsibility of Britain. And they cost eight times as much.

P.R.Os employed in 1938	7
Total now (eight at home, 11 overseas)	19
Cost in 1938	£2,550
Cost this year	£20,681

Until the war, the Board of Trade got on with its many jobs and charged the nation nothing for boosting itself. It had no public relations staff at all. This is the position now:—

P.R.Os employed (12 at home, eight abroad)	20
Cost this year	£15,893

Before the war, there were 207 P.R.Os in 16 Government departments. Now there are 1,014 employed by 32 departments. In 1938 they cost £106,450; this year the bill is £878,468.

The system of employing P.R.Os for departmental advertisement is wasteful. For the public, their only value is that they expose the weakness of the Government in tackling Civil Service economies.

P.R.Os can be counted; their cost can be traced. Other staff figures cannot be broken down and compared. The public sees that 20 Ministries are still increasing their staffs. Only 12 are reducing them. In one quarterly count the grand total of the Civil Service has gone up 8,000.

A reduction has been promised; 80,000 are to be lopped off the burden of over 2,000,000 in central and local government employ.

It is unlikely that even this pathetic little pruning will be achieved by present methods. The reduction should be tackled with a high target and with determination.

A start can be made now by disbanding the whole battalion of P.R.Os.—*From the "Daily Express."*

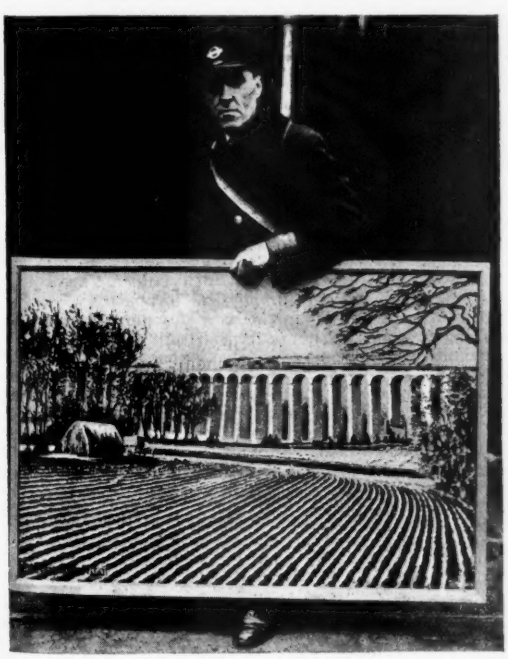
* * *

People We Have Pleased!

"I must pay a tribute to the management of the railways that, on the whole, they are some of the most enlightened of employers. I can say that now that we are taking them over, though I probably would not have said it at some other stage!"—*Mr. E. Popplewell (Newcastle-on-Tyne—Lab.), during consideration of the Transport Bill in Standing Committee.*

* * *

An engine driver was killed last week on the railway track just outside Bedford when he was struck by the 4.20 p.m. St. Pancras to Manchester express. He had left the cab of his engine to report at a signal box that his engine had developed a fault.



Mr. Albert Davis, L.P.T.B. bus driver at Hatfield Garage, arriving at the Royal Academy with his painting of Welwyn Viaduct

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

INDIA

Riots in the Punjab

The serious communal rioting, particularly in the Western Punjab, has thrown a heavy additional burden on the North Western Railway at a time when the full strain of the war years is being felt. Passenger trains in the Multan, Lahore, and Rawalpindi divisions have been curtailed drastically, and such trains as have been running have been provided with heavily armed guards. Several cases have been reported of trains being held up by rioters, who have murdered passengers and escaped with loot.

For some days, no passenger trains proceeded further north than Rawalpindi. The Railway Administration was handicapped seriously by shortage of staff, many of whom were unwilling to leave their families. The position was at one time so grave that the General Manager of the N.W.R. issued an appeal for volunteers from the general public to assist in the working of trains.

By the end of March, however, conditions were returning to normal, except in certain areas of the Western Punjab and the North West Frontier Province.

Railway Organisation in Riot Areas

The Press of Northern India has paid tribute to the conduct of the Punjab staff of the North Western Railway during the communal disturbances. Aided by the military and other employees, the railway authorities set up and operated an organisation which controlled traffic movements, and maintained continuous contact with the Government of India, the Provincial and military authorities, and the whole of the Indian railway system. A Headquarters Emergency Section came into operation at Lahore as soon as the disturbances broke out on March 4. Daily meetings were held with officials responsible for the movement of food and essential commodities, and decisions were taken from day to day regarding the maintenance of distribution.

Other railways were requested to stop booking passengers and goods to the affected areas, and to hold back wagons already loaded for such destinations. At one time the equivalent of 30 goods trains was stabled on the East Indian Railway alone. Food and essential supplies for N.W.R. staff in the affected areas were sent out by special patrol trains.

Debate on Railway Budget

The debate on the Railway Budget [see *The Railway Gazette* of March 14.—ED., *R.G.*] produced much criticism, which was directed largely against the present inconvenience of rail travel, particularly for third class passengers, and the proposal to increase passenger fares. Replying to the debate, the Railway Member said he would endeavour to spend at least Rs. 1 crore more on amenities for third class passengers. This would be in addition to the Rs. 1 crore included in the budget for such amenities as more booking office facilities, arrangements for drinking water, waiting room facilities, lighting, and so on.

Abolition of First Class

Dr. Matthai announced that the present four classes of travel would in the future be reduced to three, which would correspond in standard of comfort to the existing second, third, and intermediate classes. On branch lines it was proposed to adopt two classes, namely, special and general. The increase of 6¼ per cent. in passenger fares, the Railway Member said, would not apply to fares below 8 annas, including season tickets between points where the single journey fare is below 8 annas. This proposal would cost the railways about Rs. 85 lakhs. Although the present first class is to be abolished, it may be observed that the loss of its special amenities will be compensated to some extent by air-conditioning accommodation on the more important trains.

BURMA

Mandalay—Rangoon Train Derailed

Shortly after midnight on February 22-23, No. 2 down passenger train from Mandalay to Rangoon was derailed at mile 267/1 in the Yamethin District. The engine, a War Department "McArthur" type, rolled down a 12-ft. embankment. Seven four-wheel cattle wagons, and seven empty bogie oil-tank wagons, were derailed and piled one on top of the other. Several attendants in the cattle wagons, and a number of Burmese passengers who were travelling on the tank wagons, were either killed or severely injured. Latest reports show that seven passengers have died and eleven have been treated for serious injuries. The first and second firemen were killed in the derailment, and the driver died from his injuries later.

Derailment of Passenger Train in Burma

Scene after the derailment of a passenger train from Mandalay to Rangoon, caused by deliberate interference with the track

It has been established that the accident was caused by deliberate tampering with the track. Fishbolts, fishplates, and dog spikes had been removed for a considerable distance, and the track slewed just south of Bridge No. 497. Despite interference with certain of the joints, the first passenger coach came to rest on the bridge without derailing, and there was no telescoping of passenger stock. An inquiry into the incident is to be held by the Chief Railway Commissioner.

Cases of interference with station staff, and tampering with the permanent way at night, have caused the Burma Railways Administration to alter the main-line schedules, so that trains run only in daylight hours, and are stabled at engine-changing stations overnight. Although a slowing down of passenger and goods vehicle turn-round is involved, the effect is less serious than it might have been in consequence of the curtailment of services made necessary by depletion of coal stocks, due to recent strikes in the ports of Calcutta and Rangoon, through which the coal supply for Burma passes from the Bengal coalfields.

SOUTH AFRICA

Permanent Appointments for Non-Europeans

It has been decided that non-Europeans in the railway service are to benefit by admission to the permanent staff on the same conditions as Europeans, since it is recognised that this class of labour is part of the normal requirements of the service. Consequently, the services of non-European employees who have completed a certain minimum period of continuous employment, and are engaged on duties of a permanent nature, will not be dispensed with unless for disciplinary reasons, or on the grounds of age limit, reduction in or reorganisation of staff, permanent ill-health, or physical incapacity.

Comprehensive disciplinary regulations for non-European staff also are being introduced. The principal provisions are that dismissal from the service, or other punishment, may follow alleged misconduct only after the employee has been given every facility for presenting his case. Appeals also may be made against disciplinary punishments awarded against non-European employees.

CANADA

Exceptional Snow Conditions

In many parts of Canada the snowfall during January and February was the heaviest for many years, and drifts up to 20 ft. high were encountered on C.P.R. lines in the Prairie Provinces. The 200 snow ploughs of the C.P.R. travelled over 295,000 miles in clearing the tracks, or more than twice the distance covered in the comparable period of 1946. Drifts

blocked the main line between Calgary and Regina for the first time in its history, and a shuttle service was maintained by two Canadian Pacific Air Lines aircraft to convey passengers over this section during the stoppage.

The C.N.R. estimates that $2,500,000 were spent in keeping lines open during January and February alone. Drifts on branch lines in the Prairie regions were changed into barriers of ice, sometimes defying the efforts of ploughs propelled by three locomotives, when a partial thaw was followed by temperatures 35° F. below zero.

C.P.R. Snow-Clearing Equipment

In addition to six rotary and 194 wedge-type snow ploughs, heavy equipment used by the C.P.R. includes 73 flangers for clearing rails, and 48 spreaders for pushing snow off tracks in goods yards. Additional equipment such as snow blowers and loaders, bulldozers, pneumatic ice-chipping tools, and snow melting pits are used in terminals.

Nearly everything that operates on the railway, and nearly every facility connected with operation, is designed to meet winter conditions. All rail joints are of special design, with the nuts on the outside to allow the passage of flanger attachments on snow ploughs; cables have been laid underground at trouble spots; and the foundations of turntable circle rails are heated with steam pipes to keep rails free of snow. At terminals, air lines are laid along the tracks to supply air to pneumatic tools and blow ice and snow from switch points.

UNITED STATES

Northern Pacific Realignment

Construction work is now well in hand on the 16½-mile realignment of the Northern Pacific Railroad in North Dakota. High embankments and deep cuttings are involved in crossing rolling prairie, as well as some high-level bridges. The new route followed will reduce the length of the line, gradients, and curvature, and is estimated to cost $3,000,000.

Electronic Laboratory Car

In connection with the development of radio communication on its system, the Santa Fe has equipped a vehicle for use as a mobile laboratory. A recent application of the laboratory car has been as a transmitting station for two-way radio tests with aircraft of Santa Fe Skyway (see *The Railway Gazette* of December 20, 1946). A 100-W. V.H.F. transmitter was installed in the car, and tests were made over ranges up to 100 miles with aircraft flying at altitudes between 1,000 and 10,000 ft. By this means information is being gained as to the number of ground stations required for communication with aircraft operating a regular scheduled service. It is proposed to operate the transmitters remotely from selected points on the company's teleprinter network, using carrier transmission over existing wires as far as possible.

WESTERN AUSTRALIA

Floods on Commonwealth Railways

On January 20, heavy rains over a very short period within a radius of three miles on each side of the railway township of Cook, on the Nullarbor Plain, caused a concentration of water in a depression just to the west of Cook Station through which the line passes. A lake was formed approximately 1½ to 2 miles long by ½ mile wide, and about 3 ft. to 3 ft. 6 in. deep, submerging the line and washing out the ballast at a number of points.

Passenger trains were held for from 24 to 30 hr. One such train, travelling westwards with about 140 passengers, was held at Cook for 24 hr. within a few hundred yards of the washout. Being practically in the centre of the Nullarbor (treeless) Plain, opportunities for recreation were limited, but with true Australian hospitality an impromptu dance was arranged by the local residents, to which the passengers were invited; the local billiards hall was opened to the use of the train, and games helped to pass the time.

Publications Received

The Fordell Railway. By Dr. J. C. Inglis and F. Inglis, Larbert, Stirlingshire: Dr. Inglis, The Colony. 9¼ in. × 7¼ in. 32 pp. + folding map. Price 4s. 6d. post free.—We made brief editorial reference recently to the passing last August of the Fordell Railway, the last surviving Scottish private colliery railway serving its own port. This method of shipment was a one-time distinctive feature of the Scottish coal trade. Fortunately, this railway attracted the interest of a careful historian in Dr. James Inglis, and the results of his researches are set forth in this little book, which should be included in the library of everyone interested in railway history. It contains 33 half-tone illustrations, including a map of 1775; adequate details of the history of the original wooden wagonway and its successors; and full particulars of the locomotives and rolling stock.

British Standards for Lifting Tackle.—General Editor: Mr. A. L. Haas, I.S.O., M.I.Mech.E. Introduction by Sir William Stanier, F.R.S. London: British Standards Institution, 28, Victoria Street, S.W.1. B.S. Handbook No. 4. 355 pp. Price 12s. 6d. net.—During the past two decades, committees of the British Standards Institution have formulated a series of standards for lifting tackle. It is not claimed that, even now, those standards are either exhaustive or complete, but the institution considers that their number and importance justifies the collection and issue in a single volume of those concerning tackle to suspend, lift, and lower a load, in common use in a large variety of appliances, where failure would be liable to result in casualty. The handbook is divided into seven sections; the first five contain the technical provisions of 21 published standards shorn of extraneous matter and repetition. The last two are supplementary and complementary, but are essential to the purpose of the handbook, which is to make readily accessible all matters relating to such tackle of which purchasers and users should be aware. The last section sets forth the rules, orders, registers, and certificates current at the date of publication as legal obligations. As independent publications, most of the standards included are prefaced by cautionary or informatory forewords; all such matter has been retained in the handbook. Further information is given, as editorial notes, which it is hoped will add to the reference value. There are approximately 90 full-page tables and 70 line drawings. In his introduction, Sir William Stanier draws attention to the responsibilities devolving on the user of lifting tackle as to maintenance and renewal.

Locomotive Engineers of the Southern Railway. By Ben Webb. London: Ian Allan Limited, 282, Vauxhall Bridge Road, S.W.1. 7½ in. × 5 in. 87 pp. Fully illustrated. Paper covers. Price 3s. 6d.—This book is similar to those already published by the same author on the locomotive engineers of the G.W.R., and the L.N.E.R. In addition to biographical sketches of the engineers, and particulars of the principal locomotives designed during each regime, the book contains much useful and interesting information on railway working and locomotive performance.

Northallerton to Darlington Re-Signalling, L.N.E.R.—London: Westinghouse Brake & Signal Co. Ltd., 82, York Way, Kings Cross, N.1. 11 in. × 8½ in. 12 pp. 18 photographs, diagrams, and folding plate.—This publication is a reprint, with some additional photographs, of an article and editorial note appearing in *The Railway Gazette* of August 23, 1946, and describes the important power and automatic signalling installation completed between Northallerton and Darlington, L.N.E.R., just as the war broke out. Every feature of the work is dealt with, both from the technical and operating points of view, and the detailed diagram on the folding plate enables the working to be followed out, from location to location. The illustrations showing the lines in the neighbourhood of the stations bring out very clearly the great simplicity of modern methods of giving signal aspects when compared with the old semaphore system, more involved on the former North Eastern line than on some others. The booklet is excellently produced.

Grinding Machines.—A series of new illustrated pamphlets received from the Churchill Machine Tool Co. Ltd., Broadheath, Manchester, describes various types of grinding machinery in which the company specialises. Churchill centreless grinding machines cover a wide range of work, and have a high productive capacity, but are characterised by the simplicity with which they can be adapted for different jobs. Among their important features is the use of the patented Hydrauto bearing to carry the grinding wheelhead spindle. This is a self-adjusting bearing, and maintains automatically under all conditions the minimum practicable thickness of oil film.

An addition to the range of semi-universal grinding machines is a new model, Type "OH," which is a modern development of the widely used Type "O" machine. A rapid means of changing over from external to internal grinding makes the machine capable of handling a larger variety of work than can be dealt with normally on small universal grinding machines of smaller capacity. Another pamphlet describes the range of Churchill roll grinding machines, which are built to the same accurate limits and alignments as are the smallest machines in the company's range of products. Many Churchill roll grinding machines which have been in use for upwards of 20 years are still producing the same accuracy in cambered rolls as when they were installed.

The Development of Locomotive Power at Speed*

Mr. E. L. Diamond presents a criterion for calculating power and evaluating performance

THE mean effective pressure in a locomotive cylinder can readily be calculated for any given steam conditions, valve events, and clearance, assuming only the back pressure during exhaust. The calculated mean effective pressure is independent of the speed, so that the indicated horsepower derived from it would be directly proportional to the speed. In practice, the mean effective pressure falls as the speed increases, and it is this increasing deviation from the ideal which may limit the power of the locomotive as effectively as the capacity of the boiler.

Progress in Fifty Years

Fifty years ago, the attenuation of the indicator diagram at express speed was so great and so variable as to render any conclusions to be drawn from calculated mean effective pressures of purely academic interest.

Today, the rate of deviation of the mean effective pressure with increase of speed still varies widely, and is the most important characteristic of the engine, but in the best designs it has been reduced to such an extent that an analysis such as that attempted in the first part of the paper, of the relationship between mean effective pressure and the boiler pressure, cut-off, and clearance, together with the corresponding cylinder efficiencies, becomes of great practical importance, especially in designing locomotives for the relatively higher pressures now being adopted.

With the paper, are basic data graphs giving calculated mean effective pressures for all steam pressures from 120 lb. per sq. in. to 320 lb. per sq. in., and over the whole range of economical cut-offs from 5 per cent. to 50 per cent. They also give the data for percentage clearance spaces from 5 to 15 per cent. The relative efficiencies are plotted over the same range of boiler pressures and cut-offs for 5, 10, and 15 per cent. clearance respectively.

These curves show that, with the same clearance, it is necessary for a locomotive with a boiler pressure of 250 lb. per sq. in. to be worked at effective cut-offs from 20 to 30 per cent. of the stroke shorter than a locomotive with a boiler pressure of 180 lb. per sq. in., in order to maintain the same relative cylinder efficiency. In other words, if a locomotive with a steam pressure of 250 lb. per sq. in. is normally worked at the same effective cut-off as a locomotive with a pressure of 180 lb. per sq. in., say, 15 per cent. cut-off at full speed, the relative cylinder efficiency will be 7 per cent. less.

In view of the fact that the corresponding Rankine cycle efficiencies for the two pressures are 20·3 and 18·4 per cent. respectively, this means that the effect of the reduced expansion ratio nearly nullifies the gain in efficiency due to the higher pressure, the respective cylinder thermal efficiencies being 17·3 and 17·0 per cent.

Owing to the effect of clearance, it is theoretically impossible under normal running conditions at speed to realise the higher cylinder thermal efficiencies associated with higher steam pressure, as compared with locomotives of lower boiler pressure equipped with modern valve gears permitting early cut-off working, unless compound expansion is adopted. It should be said that boiler pressures have been increased primarily in order to increase the power obtainable within the limits of the prescribed loading gauge and axle weight; but any limitation of efficiency is likewise a limitation of power.

Another graph completes the basic data by giving the steam consumption per indicated horsepower-hour over the full range of steam pressures and cut-offs for 5, 10, and 15 per cent. clearance respectively. These graphs present the net effect of the changes in opposite directions of the Rankine efficiency and the relative efficiency respectively.

Dalby's straight-line law* for the deviation of mean effective pressure

$$p = c - bv$$

where c and b are constants for a particular engine and cut-off, implies that the mean effective pressure falls steadily to zero.

With superheater engines, at any rate, this is contrary to experience. Curves for mean effective pressure are plotted for a diverse and representative range of locomotives in the paper, and the plotted points, generally, show a rapid drop from the calculated mean effective pressure in the initial stages and tend to straighten out later.

Such curves correspond to a simple exponential law, the diminution of mean pressure being proportional to some power of the speed of revolution less than unity:—

$$P_n = P_e - kN^{1/x}$$

where P_n is the mean effective pressure at N r.p.m., P_e is the calculated basic mean effective pressure read from the graph, and k is a constant characteristic of the particular locomotive. Trial and error showed that $1/x$ does not vary greatly over the whole range of curves, and that the error involved in taking as a mean the square root of N was generally within the scatter of the points.

It was also found that k is a fairly constant proportion of P_e for any particular engine, so that the equation of the curves reduces to the convenient form

$$P_n = P_e\left(1 - \frac{1}{k}\sqrt{N}\right)$$

The value of k in this equation is shown for every curve plotted, together with the mean value in the form of a "characteristic power equation" for each locomotive, on the diagrams.

Estimating Power at Speed

This equation not only gives more accurate results over a wide range of speed for superheater locomotives than Dalby's law, but is a more accurate guide in estimating the power at speed of a projected design than either Cole's constants or the Kiesel formula, with its illogical basis in the boiler, provided appropriate values of the constant k are taken. Each designer can establish such values fairly closely from indicator diagrams from his own previous designs, but for general use the following values are suggested:—

Type of Engine	
Simple-expansion with short-lap valve gear, piston or slide valve	25
Simple-expansion with long-lap valve gear, piston valves	45
Simple-expansion with modern design of poppet valves and steam passages of maximum section	75
Compound locomotive with short-lap valve gear, piston or slide valves ..	30
Compound locomotive with long-lap valve gear, piston valves	50
Compound locomotive with modern design of poppet valves and steam circuit of maximum section	80

The value of P_e may be read directly from the curves in the paper, but the method will give greater accuracy if the value is calculated exactly for the point of compression appropriate to the particular valve-gear design adopted. The assumed exhaust pressure of 18 lb. per sq. in. abs. must not be modified, however, as this would alter the basis of the constants. The higher the value of k, that is, the more nearly horizontal the mean pressure curve and the shorter the cut-off, the more necessary is it that P_e should be accurately determined.

Dalby's law involved two constants, neither of which could be used independently as a criterion of performance. The advantage of a single constant is obvious, but since it has to accommodate two different classes of loss, namely, the pressure drop during steady flow between boiler and valve gear, and the complex cyclic losses between valve gear and atmosphere, any abnormal relationship between the two will be shown up by the fact that no value of k will give a curve conforming with the mean line through the observed values of mean effective pressure.

If, on the one hand, the drop of pressure in the steam chest is relatively small, but the steam distribution is bad, the slope of the plotted points will be steeper than the exponential curve given by the characteristic power equation, and will, in fact, conform more nearly to Dalby's straight lines. On the other hand, if the valve gear gives a good steam distribution, but there is an excessive pressure drop through the superheater and main steam pipes, or excessive clearance, then the exponential power curve will be steeper than the mean slope of the observed mean effective pressures. Examples of both kinds of abnormality are given in the paper.

Abnormal Losses

In well-designed locomotives such abnormalities generally do not occur, and the characteristic power equations fit closely the observed values of mean effective pressure over the normal range of speed. It may be reasonably claimed, therefore, as an additional advantage of this method of plotting characteristic power curves, that it shows up at once such abnormal losses.

To determine the value of k, and hence to plot these curves, a value of mean effective pressure P_n at a speed of, say, $N = 250$ r.p.m., should be adjudged as falling on the average line through the available data for a particular cut-off. (One observed value only can be taken if no others are available, though the scatter of the points in the diagrams in the paper shows that this may give misleading results.) The value of k is then given by

$$k = \frac{P_e \times \sqrt{N}}{P_e - P_n}$$

P_e being read off from curves of calculated mean effective pressure in the paper.

It is sometimes found that the value of

* Abstract of a paper presented by Mr. E. L. Diamond, M.Sc. (Eng.), A.M.I.Mech.E., to the Institution of Mechanical Engineers on February 21

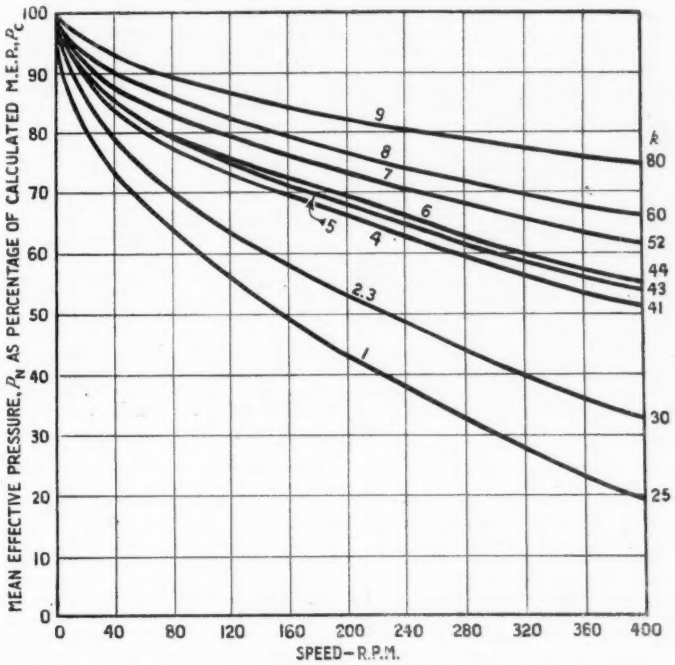
* Proc. Inst. C.E., 1905, vol. 164, p. 329

k for very short cut-offs differs considerably from the average value for other cut-offs. Such abnormal values should be ignored in determining the characteristic power equation because (*a*) no locomotive is designed to give maximum power at the shortest cut-offs, and (*b*) the probable error in evaluating P_c increases with short cut-offs, mainly on account of the increase in the proportion of clearance steam.

The characteristic power equation gives the mean effective pressure, and hence the power at any speed *for a particular cut-off*. The reason why other proposed power formulæ have been related to the boiler is to eliminate this condition, and to give the maximum horsepower of which the locomotive as a whole is capable, or the power at a specified rate of evaporation.

The author contends that this is fundamentally wrong in principle. The first section of the paper shows how greatly the economy of the engine is affected, provided the steam distribution is good, by the relationship of cut-off and clearance to boiler pressure. The good designer will choose the dimensions of his engine to enable it to give the maximum continuous power required at an economical cut-off for the steam pressure he is using. The data in the paper will facilitate such determination.

The logical procedure, therefore, is to state the power of the locomotive at that specified cut-off, and to design the boiler to supply sufficient steam to feed the engine at that cut-off at the highest contemplated speeds, taking a maximum rate of evaporation appropriate to the design of the boiler, and not a fixed and universal figure as was the practice of the German State Railways.



Mean effective pressure curves for various locomotives on truly comparative basis

The values of k in the characteristic power equation for each locomotive are given alongside the corresponding curve

1. Midland 4-4-0 superheater locomotive (1917)
2. Original P.O. compound superheater Pacific locomotive (1909)
3. Pennsylvania K4S locomotive in original form
4. Pennsylvania K2A locomotive
5. Pennsylvania E6S locomotive
6. L.M.S. rebuilt "Royal Scot" locomotive
7. Pennsylvania K4S locomotive rebuilt with Franklin poppet valve gear
8. Rebuilt P.O. compound locomotive No. 3705 (Chapelon)
9. Pennsylvania T1 locomotive with Franklin poppet valve gear

Assessing Test Results

The coefficient k also offers a criterion whereby the test results of a completed locomotive may be assessed. Thus, the accompanying diagram shows the performances of all the representative locomotives referred to in the paper on an *absolutely comparative basis* by plotting the mean effective pressures as a percentage of the calculated mean effective pressures. Comparative curves of mean effective pressure on a speed basis have frequently been published in recent years as a percentage of boiler pressure. Such curves, however, are not comparable, even if they are for the same nominal cut-off, because, as is shown in the first part of the paper, the percentage of the boiler pressure attainable as mean effective pressure without loss will vary with the boiler pressure and clearance for the same nominal cut-off.

It is important to emphasise, however, that k is not a direct index of thermal efficiency, but rather of the power-weight ratio at high speed, which for railway operation is considerably more important. Such a coefficient derived from test results also should be related always to the designed characteristics of the locomotive, as these are subject to practical limitations which the designer has to take into account. A high value of k, for instance, is not necessary for shunting or banking engines.

The relationship of the coefficient k to the relative cylinder efficiency is of some interest in connection with the use of the data curves for steam consumption as a basis for boiler design. Comparison with published test results shows that the *minimum* recorded steam consumptions are remarkably close to the figures given by the data curves for optimum conditions, except for early locomotives, like the Midland engine of 1917, which have a low value of k. Even under conditions of relative inefficiency, as at late cut-offs, agreement is good if allowance is made for the difference between nominal and effective cut-off.

Test plant data, however, show that at any particular cut-off the steam consumption may vary by over 25 per cent. due to various causes, especially varying steam temperature and leakage, and that, generally, it is higher, the lower the speed. Moreover, in practice the condition of maintenance of a locomotive has an overriding effect on steam consumption, leakage being a principal factor. A margin of at least 30 per cent. must, therefore, be allowed over the minimum consumption given by the data curves.

DISCUSSIONS ON WELDING.—Various aspects of welding technique have been discussed at a series of meetings held by the South London branch of the Institute of Welding. On February 7, Messrs. R. H. Cooke and G. S. Loates presented a paper on "X-rays and their use in Weld Testing, with reference also to Gamma-rays." Mr. J. D. Beddows, of the Aluminium Development Association, read a paper on "The Welding of Aluminium" at the Lewisham Technical Institute, on March 7, and on March 21, Mr. M. Riley, of the Quasi-Arc Co. Ltd., presented a paper entitled "Detailed Design of Arc Welded Components," at the Gravesend Technical Institute. A symposium on the welding of light-gauge metals will be held at the Institution of Marine Engineers, 85-88, The Minories, London, E.C.3, at 7 p.m. today, April 11. Visitors are welcome.

EFFECT OF INFERIOR COAL ON G.W.R. LOCOMOTIVES.—The fireboxes of G.W.R. locomotives were constructed to burn Welsh coal, each ton of which in 1938 produced 14,960 B.Th.U. Today, the coal used produces only 13,840 B.Th.U. a ton—a permanent cut of 7½ per cent. with a considerable increase in ash and clinker and choking up of the grate. These are important contributory factors to bad timekeeping by G.W.R. trains. They are placing a heavy burden on the operating departments, and are increasing considerably the work of the engine crews and others in the locomotive departments.

IMPROVEMENTS TO L.M.S.R. MAIN-LINE LOCOMOTIVES.—The L.M.S.R. is equipping 33 standard 4-6-2 express passenger locomotives with self-cleaning smokeboxes, hopper ashpans, and rocking grates, such as are standardised already on the majority of the company's new locomotives. These improvements will be made as the engines pass through the works for general repair. The L.M.S.R. is also to re-equip 366 express passenger locomotives, comprising the whole of power classes "7P," "6P," and "5XP," with speed indicators.

Telescopic Goods Rates Computed on Continuous Mileage

Experiment by nineteen Indian railway systems

ON February 1 this year, 13 Class I railways in India, each having an annual gross income of not less than Rs. 50 lakhs, two of the Class II railways, having an annual gross income of less than Rs. 50 lakhs, but exceeding Rs. 10 lakhs, and four of the Class III group, with gross earnings of not more than Rs. 10 lakhs a year, embarked on a new experiment in railway rating. The main essentials of this experiment are: (*a*) Charging on a cumulative principle with a descending scale of rates as the distance increases; and (*b*) computing the total rate on the basis of continuous mileage when the transit is over the lines of more than one railway system.

Hitherto, all standard class rates of Indian railways were based on flat scales. There are many schedule rates which have a telescopic basis, but these may be considered as exceptional rates. Again, rates were worked out separately for the mileage of each railway, and added up to obtain the total rate. There had been a persistent demand from traders for the removal of these two obvious defects. The Railway Department of the Government of India had accepted the demands in principle, and from time to time advised the general public by means of statements in the Central Legislature, and at meetings with representatives of trade and commerce, that the railways rating structure required to be altered radically to eliminate the intricacies and anomalies it contained. To implement this undertaking, the Railway Board, through which the Government of India carries out its railway policy, decided towards the end of 1946 that an experiment should be made by Indian Government Railways, and others who may be agreeable to join it, with telescopic scales of rates computed on a continuous mileage. Three commodities, namely, manures, oilcake and bonemeai (for manures), were selected for the experiment.

The proposed scale has been called Special Class "A," and is based on 0·140 pie per maund per mile for the first 200 miles, and thereafter declines at a steady rate down to 0·128 pie per maund per mile at 1,500 miles, at which distance the rate per maund will be Rs. 1 (1 maund = 82·284 lb.). This rate will be in the nature of a blanket rate, and will apply to all movements in excess of 1,500 miles. This involves acceptance that there is a limit to what traffic can pay for transport.

When the experiment is extended to other commodities, it is likely that a different maximum limit may be accepted, but such a limit is not likely to be any higher than 1,500 miles. For a correct appreciation of the principle, it must be remembered that rail distances in India can exceed this limit to a great extent. The distance from Landi Kotal, the extreme north point on Indian railways, to Trivandrum, in the extreme south, is 2,605 miles; and from Zahidan in the extreme west to Ledo in the extreme east is 2,859 miles. Zahidan and Trivandrum are 2,974 miles apart by rail.

As rail freight charges have been a deterrent to movement between these extremes, the principle of charging a blanket rate for any distance beyond 1,500 miles will remove a serious obstacle in the way of transport by rail over exceptionally long distances.

The new scale involves no change in rates over the major railways for distances up to 150 miles, as it coincides up to this distance with the schedules at which over 90 per cent. of traffic in manures, oilcake and bonemeal moved before February 1. Beyond 200 miles, there will be a reduction in rates over the Bombay Baroda & Central India, Great Indian Peninsula, Jodhpur, Madras & Southern Mahratta, Mysore State, and South Indian Railways; while beyond 150 miles there will be some increase in respect of traffic carried by the Bengal Assam, Bengal Nagpur, East Indian, North Western, and Oudh Tirhut (E.N.W. zone) railways. It was inevitable that assimilation of various schedules into one common scale would involve both reductions and increases. The synthesis, therefore, has been made by the Railway Board on the fairest basis possible with due regard to the fact that, as a result of the application of the principle of continuous mileage, there will be reductions on certain traffic interchanged between B.A., B.N., E.I., N.W. and O.T. Railways, the total distance traversed on each system is not in excess of 150 miles.

Together with the telescopic method of charging on a continuous mileage, several other important recommendations of a committee set up last year to go into the question of post-war goods rates for Indian Railways, also have been accepted. Important among these is the principle of carrying traffic by the shortest route. All traffic coming under the scope of the present experiment will be carried normally by the route which is shortest after inflation of distances at the rate of 75 miles per transhipment at break-of-gauge junctions.

Uniformity has been brought about also in transhipment charges. On account of the variety of gauges and working conditions, there were numerous scales of transhipment charges in forces on the different railway systems. Not only did they have different bases, such as wagon, ton, maund, and loads of individual packages, but the scale of charges also varied from one part of the country to another, the variation being as large as 1 pie to 18 pies per maund. Under the experiment begun on February 1, the transhipment charge will be uniform at 3 pies per maund in the case of manures and oilcake, and 2 pies per maund on the carrying capacity of the wagon used for bonemeal.

A natural consequence of the introduction of the special Class "A" rate has been the withdrawal of exceptional classifications, and cancellation of the innumerable station-to-station rates which were in force for these commodities throughout the country. One major system alone, the G.I.P., had to cancel as many as 91 such rates. The special class "A" rate is designed to provide a workable substitute for the rates based on classes, schedules, and station-to-station rates, at which the three comodities were charged before February 1. It is a great step towards simplification of the Indian railway rating structure. It is expected that rates based on special class "A" will not only be fair to the trade, but also will earn for the railways a revenue approximating to that earned under the old system.

WELDING INSTRUCTIONAL FILMS.—For some years the British Oxygen Co. Ltd., Grosvenor House, Park Lane, London, S.W.1, has made use of sound films for the training of welders, and at the present time the firm has a library of some 30 films on various aspects of welding, one of which covers the application of welding to railway track work, and another which deals with locomotive copper firebox repairing. These films are available on loan to technical societies and other interested organisations. Two new films, both approximately 40 minutes in length, were shown recently at the Sales Technical Service Department, North Circular Road, London, N.W.2, where courses of instruction are held regularly in the B.O.C. welding school. The first film, which is of an elementary nature, explains the equipment and precautions necessary for oxy-acetylene welding, and introduces the exercises which the beginner must practice in order to master blowpipe control, metal manipulation, and the various ways of ensuring good fused penetration. In the second film, four methods of welding employed in industry are demonstrated, namely, leftward, rightward, and vertical welding with one or two operators, and the special advantages of each are carefully considered. Both films are essentially training films to supplement the practical experience which alone can make a good welder.

SOUTHERN RAILWAY LECTURE & DEBATING SOCIETY.—Mr. R. E. Sinfield, Assistant Continental Superintendent, Southern Railway, on February 13, addressed the Southern Railway Lecture & Debating Society on "Continental Travel," in place of Mr. R. H. Hacker, Continental Superintendent, who, on account of other commitments, was unable to be present. Mr. H. A. Short, Deputy Traffic Manager, presided. The paper traced the history of travel to and from the Continent from earliest times until the present. Mr. A. E. Hammett, Commercial Superintendent, proposed a vote of thanks to the speaker and the chairman, which was seconded by Mr. S. B. Warder, Assistant to Chief Electrical Engineer. On February 27, Mr. F. E. Campion, Maintenance Engineer, lectured on "Six Years of War," and the meeting was presided over by Mr. A. Dean, Assistant Chief Civil Engineer. The lecture described some of the formidable tasks set for the Chief Civil Engineer's Department by the recent war; that the railways had been fully prepared in 1939, was, as the speaker showed, the result of plans which had been carefully thought out during the preceding two or three years. Mr. L. G. B. Rock, Permanent Way Assistant to Chief Civil Engineer, proposed a vote of thanks to the speaker.

ENGINEERING APPRENTICESHIPS.—The machine tool firm of H. W. Ward & Co. Ltd., of Birmingham and Worcester, has revised the apprenticeship scheme which has been in operation for upwards of 30 years. Boys are eligible to become apprentices at the age of 16, but those already employed in the works are allowed time off each week, with pay, when between the ages of 14 and 16, in order to take a preparatory course at a technical school. Apprenticeship lasts five years, at the end of which a certificate is issued. Apprentices of exceptional ability are given the opportunity of qualifying for the award of an engineering scholarship at Birmingham University. Full particulars are given in a new booklet.

New Tunnel at Thurgoland, L.N.E.R.

A new bore is necessary to enable overhead equipment to be erected in both tunnels for the Manchester-Sheffield electrification

Penistone end of tunnel, showing the demolished overbridge and the level crossing that will be replaced by a new bridge

A NEW single-line tunnel is being built alongside the existing double-track Thurgoland Tunnel, between Wortley and Penistone on the L.N.E.R. Sheffield-Manchester main line. When complete, the new tunnel will accommodate the down line, and the old tunnel, which is too small for the erection of overhead electrification equipment for two-way traffic, will carry the up line.

Although the new tunnel will be under a quarter of a mile long, it involves the removal and dumping of something like 50,000 cu. yd. of earth and rock weighing nearly 70,000 tons. The approaches to the new tunnel are now being cleared, and this work includes the removal of part of a moss-grown pile of boulders taken from the original tunnel over 100 years ago. Work is proceeding simultaneously at the approaches to both ends of the new tunnel, and excavation is being carried out by means of dragline attachments to crane excavators.

At the Penistone end, the spoil is being removed from the site by three Muirhill pneumatic-tyred dumpers, running on special roads made with perforated steel plate—the same material as was used to construct wartime landing strips for aircraft. These three dumpers carry the spoil to a dump 200 yd. away at a rate of 40 tons an hour, and they are able easily to keep pace with the crane excavator.

At the Wortley end of the new tunnel, spoil is removed from the site by means of a narrow-gauge railway on which 8-ton trains of up to five loaded skips are drawn by small diesel locomotives. Most of the spoil here at present consists of earth and shale, and it is being cleared to a dump 300 yd. away at a rate of 50 tons per hour.

On December 15, 1946, the running lines of Thurgoland were closed for seven hours to enable an overline bridge at the Penistone approach to the tunnel to be demolished. After removal of the filling, the stone arch was pulled down by a goods engine hauling on steel ropes attached to the structure. Although built a century ago, and held together only with lime mortar, the arch was immensely strong. Nevertheless, the work was completed on time with a minimum of interruption to train services. A new overline bridge of concrete-encased steel is to be erected, and, when this is completed, the nearby level crossing will be dispensed with. Access to the village of Rompticle will be by means of the reconstructed bridge and a new road about a quarter of a mile in length.

Method of Blasting

The work of blasting the new tunnel is complicated by the necessity of avoiding any interruption to the train services on adjacent running lines. To minimise risk of this, small splitting charges are being used, each containing only about 6 oz. of explosive. The effect of these charges is to split the rock and cause it to fall into a position from which it can be removed easily. To ensure complete safety, blasting does not take place when trains are in the vicinity.

The new tunnel will be bored through rock throughout its length. The height of rock above the tunnel, however, varies from only a few feet at the Wortley end, to approximately 20 ft. at the Penistone end. Above the rock there is anything up to 55 ft. of shale and earth.

Despite the difficulties resulting from interruption of the work when trains are passing, it is estimated that the new concrete-lined tunnel will be completed by midsummer, thus achieving another step in preparation for the electrification of the L.N.E.R. line from Manchester to Sheffield and Wath.

The work of constructing the tunnel is being undertaken by John Cochrane & Sons, Limited. Sir William Halcrow & Partners, Westminster, are the Consultants. The L.N.E.R. District Engineer at Guide Bridge, Mr. C. B. Glenesk, will take over the tunnel on completion, and his staff will then have the task of relaying the track for the up and down main lines. The down line will traverse the new tunnel. The rails for the up line will be re-positioned in the centre of the existing tunnel which will then accommodate the overhead equipment necessary for carrying out electrification.

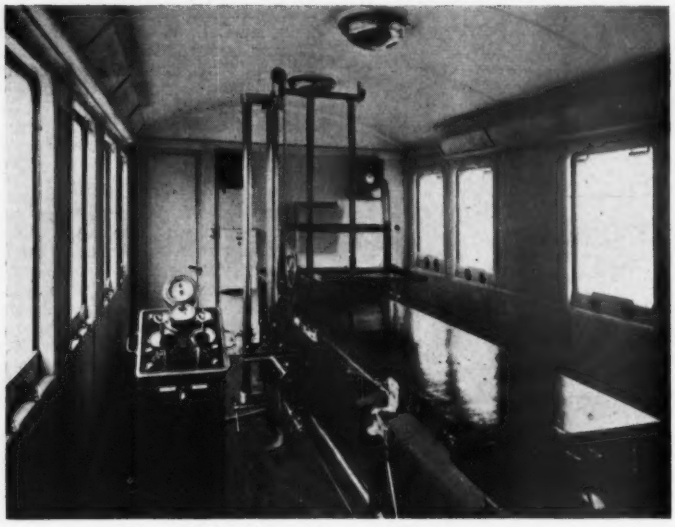
DEAN & DAWSON HEADQUARTERS DEPARTMENTS.—The headquarters departments of Dean & Dawson Limited are now situated as follow:—General Manager, Secretary, British Department and Continental & Overseas Department: 14, Bolton Street, London, W.1 (telephone: Grosvenor 4701-3; telegraphic address: Deandawson Audley); Accountant: Blandford Square, London, N.W.1 (telephone: Ambassador 2641); Publicity Department: (temporarily) 81, Piccadilly, London, W.1 (telephone: Grosvenor 3333-40).

MODEL RAILWAY CLUB EXHIBITION.—The first post-war exhibition of the Model Railway Club was opened at the Central Hall, Westminster, on April 8. Although the space available is limited as compared with pre-war years, the basement in which working layouts were shown still being requisitioned, a varied range of exhibits of high standard has been assembled. Members continued their model-building activities during the war years and in the Services. A German second class coach, with internal fittings, shown on one of the stands, was built by Mr. F. G. Roomes while with the B.A.O.R. The same exhibitor shows a section of a portable electric railway in which the current is supplied to studs in the sleepers instead of to a continuous third rail. While pre-grouping locomotives have attracted many members, models of current types have called forth an equal standard of craftsmanship, a noteworthy example being a Southern Railway "Merchant Navy" Pacific by Mr. G. J. Jefferson. A lady exhibitor, Mrs. Boswell, shows her model of a N.B.R. 0-6-0 on the L.N.E.R. stand. Among the L.M.S.R. exhibits, much attention is attracted by a North London 4-4-0 locomotive and train of 4-wheel coaches under construction by Mr. G. E. Bigmore. Models of earlier G.W.R. locomotives include a Dean single and a de Glehn compound by Mr. P. G. Rose. Several Caledonian, North British, and G. & S.W. models by Messrs. A. B. McLeod and H. G. Kerr give a Scottish pre-grouping flavour to the gallery exhibits. The main-line railways and London Transport exhibit several models of their equipment, and a passenger-carrying track is being operated by the Society of Model & Experimental Engineers. The exhibition closes tomorrow (Saturday) at 9 p.m.

UNITED STEEL COMPANIES 1947 CALENDAR.—We have received from the United Steel Companies Limited a desk calendar and diary for 1947. This is a convenient publication measuring 7 in. by 4¼ in. and provided with a ring-type binding which permits the pages to lie flat when opened. Copies may be obtained on request from any of the district offices of the United Steel Companies. An apposite quotation from Adam Smith on the title page observes that the accumulation of capital by individuals for the purpose of bettering their condition "has maintained the progress of England towards opulence and improvement in almost all former times, and, it is to be hoped, will do so in all future times."

Medical Welfare Train, Northern Region, S.N.C.F.

Former saloon coaches equipped with X-ray apparatus for carrying out 600 examinations daily



Part of the X-ray photographic compartment

IN 1932, two railway coaches, one fitted with radioscopic and radiographic apparatus, and the other equipped as living quarters, were put into service on the Northern Region of the French National Railways Company, for work in the prevention of disease among members of the staff and their families.

In the following year, a waiting-room coach was added, and the three coaches were in constant use until the invasion in 1940. After a short interval, the service was resumed, and continued until April, 1944, when the train was badly damaged during an air raid.

Arrangement of New Train

A new train has been completed recently at the French Railway Workshops at Le Landy, near Paris, made up of two sections, the first of which comprises a radiological coach, a coach fitted up as living quarters, and a waiting room coach; and the second section a radiological coach to function independently.

The coaches used are former P.L.M. saloon coaches, fitted with Northern Region bogies to facilitate maintenance, and the equipment has been specially designed in close collaboration with the Medical Service of the Northern Region of the S.N.C.F.

The radiological coach included in the first section comprises a small waiting-room with accommodation for 12 persons, two dressing cubicles which communicate on one side with the waiting room and on the other with the consulting room (equipped with a couch for examination purposes), a radiological room fitted with radioscopic and radiographic apparatus, a laboratory for developing X-ray photographs, and, finally, a compartment with a collapsible bunk for the attendant.

The living coach provides quarters for the doctors and nurses, and includes a kitchen, a dining compartment accommodating six persons, two bedrooms for the doctors and two for the nurses, and three dressing rooms with lavatory.

The waiting room coach has seating accommodation for 54. The interior fittings are simple, and include hinged benches with collapsible backs which can be turned up against the sides of the coach to facilitate cleaning, two lavatories, and an alcove containing a boiler for central heating. Special fluorescent lighting fittings have been installed.

It is intended to use this coach also for meetings, lectures on welfare, etc., to the families of the staff, and to serve teas to the children, for which purpose alternate benches can be replaced by tables.

The heating system is the same for each coach. A self-contained unit feeds the radiators, the size and number of which have been fixed to give the requisite temperature for each room.

Current for electric lighting can be obtained in each coach alternatively from a self-contained 24-volt unit or from a 110-volt main supply when the coaches are stationary. Otherwise, the equipment follows standard practice, although it may be mentioned that red, blue, and white concealed lighting also has been installed.

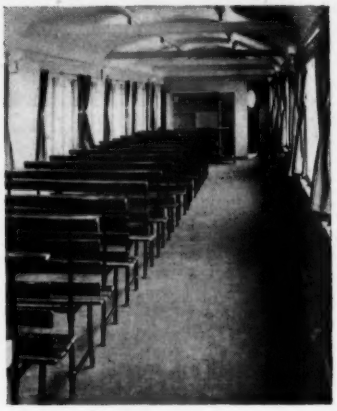
The radiographic apparatus is supplied with current obtained from a hook-up with the 110-volt main-supply circuit. Special precautions also have been taken to avoid the risk of damage to the apparatus while the train is in motion. The whole of the electrical equipment can be worked off the main supply or a generator.

An Independent Coach

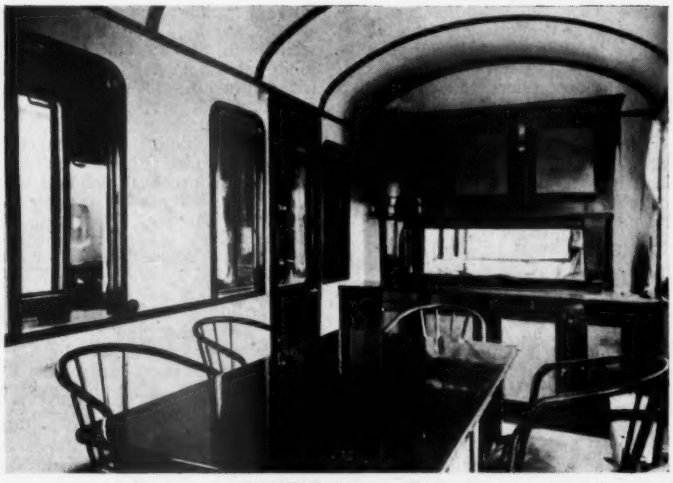
The second section of the train consists of a coach which can function independently. Equipped so that examinations can be effected rapidly, this comprises a waiting room, 14 dressing cubicles arranged in two groups of seven on each side of a central corridor, a consulting room for the doctor, equipped with a desk and a couch for more thorough examinations, and a radioscopic room from which the nurse can communicate with the doctor by telephone.

The company has decided that the prevention of tuberculosis shall not be the sole object of this service. It is intended to carry out on each subject a thorough annual examination covering the whole body, and to this end it is planning the addition of a further coach.

By providing this new health welfare service, which supplements the radiological unit that readers of the French Railways staff magazine *Notre Metier* recently presented to the Medical Department, the S.N.C.F. will continue its work in the field of preventive medicine.

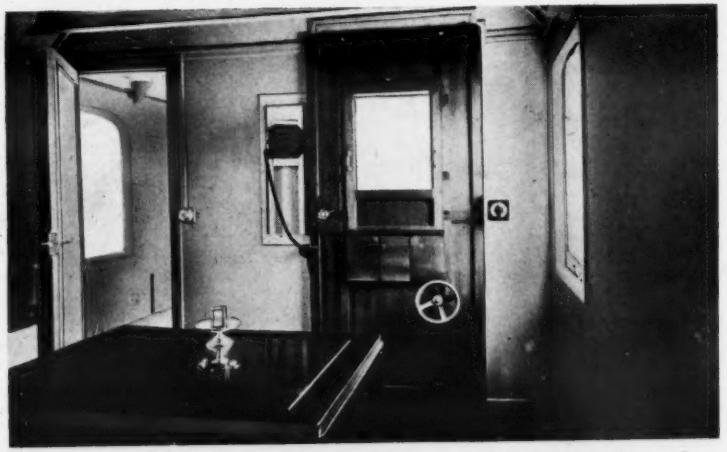


Waiting room coach



Staff dining coach

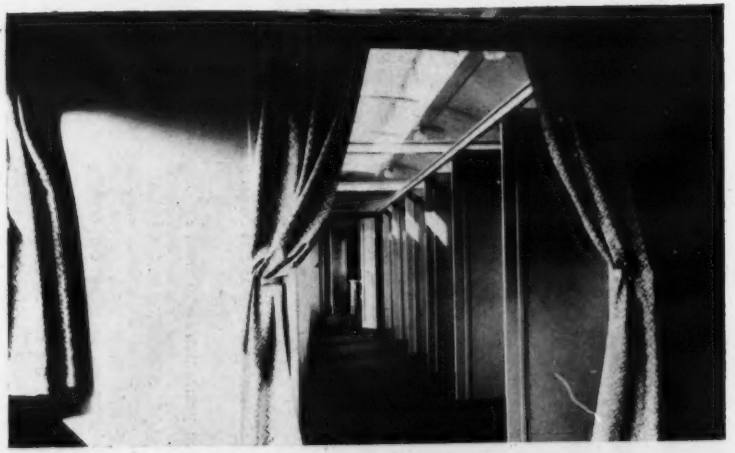
Medical Welfare Train, Northern Region, S.N.C.F



Consulting room and X-ray screen in the radioscopic section

Office and examination room in the radioscopic coach

Waiting room in the radiological coach



Dressing cubicles in the independent X-ray coach

Reconstruction of a Machine Tool Works at Manchester

Modernisation of layout to increase production

Showing the spacious layout of the new light assembly shop

FOR some years, there had been serious congestion at the Park Works of David Brown & Sons (Huddersfield) Ltd., because of the continual growth in the business of this firm; even before the war ended, premises to allow for expansion had become an urgent necessity.

There was a difficulty to be overcome, however, because the site at Huddersfield was incapable of further development, even if it had been considered desirable to enlarge a factory which already was finding accommodation for 3,000 employees engaged on specialist work.

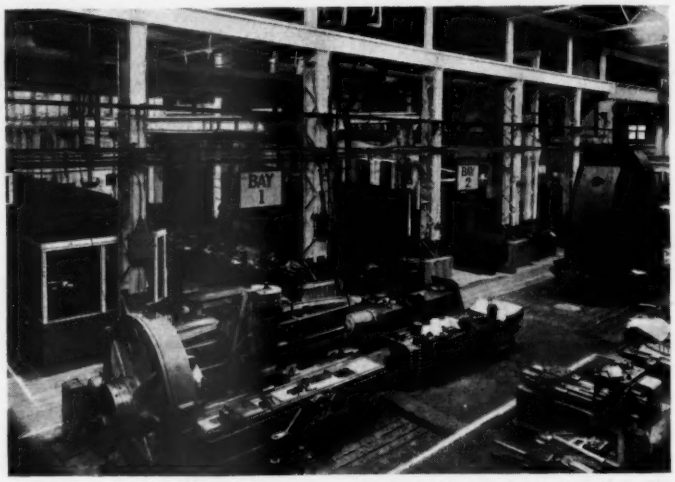
Amalgamation

The problem was solved by the acquisition of Muir Machine Tools Limited, Manchester, when it was found that such an amalgamation could be accomplished with the minimum disruption of the smooth running of the parent organisation.

Despite difficulty in the supply of materials and labour, and the demand that building operations must not interfere with production, the reconstruction of the Muir works, which was begun in December, 1944, and carried out in 20 separate operations, now has been completed.

The Muir works, which was founded more than a century ago, presented a problem in reconstruction. Situated in a district which suffered severely from enemy bombing, parts of the buildings had not received even emergency patching, and all roofs needed renewal. The position was complicated further by the need for complete modernisation of layout.

The plan of development was divided into 20 separate operations. The first began in December, 1944, directed against the Old Mill abutting the River Irwell which had been in irregular use as a pattern store and was now required as a pattern shop. The roof was repaired, the ground floor rendered in concrete, 36 new windows fitted, a new 2-ton electric hoist erected, new electrical systems laid in, and, on the ground floor, a works lavatory installed to accommodate 60. The old pattern shop then became the drawing office.



Heavy assembly shop at the works of Muir Machine Tools Limited

The works first-aid dressing station, now ideally sited on the ground floor, was provided in an operation that also gave a new electrical sub-station and distribution system. New dining rooms for foremen and senior staff and executives, in a compact group with kitchen, canteen office, store, cold room, etc., are situated on the second floor. The works canteen also has been removed and modernised, and the old site thrown into the planing department.

Demolition of the old first-aid department and works office has given more room to grinding, boring, slotting, milling, inspection, etc., and other works now completed include a new swarf disposal section and tool maintenance department, new "line flow" light assembly and reconditioning shops, works administration offices on the site of the former heavy turning department, reorganisation of existing first-floor offices, heat treatment shop, and new boiler house and maintenance department.

Flow of Material

Three parallel bays house the turning section, heavy machining and grinding section, and the planing section. The stores flank the turning bay, and the material flows through the machine shops to the light fitting bay or the heavy fitting shop.

The heat treatment shop adjoins the stores and turning bay, and at the end of the heavy fitting shop is an enclosed department where indexing wheels for large hobbing machines are cut, checked, and, if necessary, corrected. The temperature is thermostatically controlled.

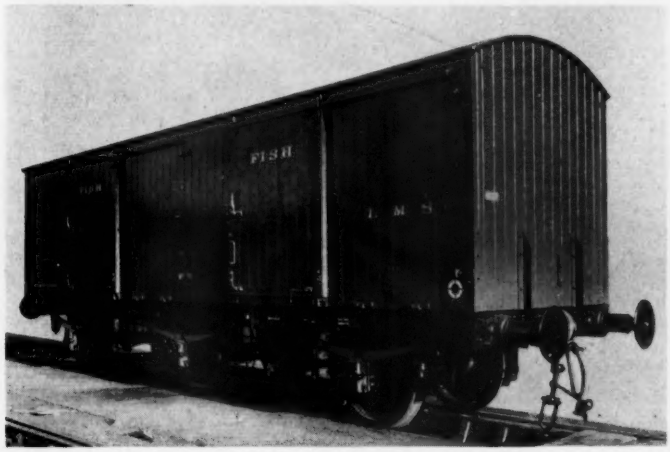
The drawing office was faced with the task of bringing all current drawings to a new standard, which entailed re-drawing several thousand details, as the David Brown organisation uses the English method of projection. Draughtsmen had to familiarise themselves with different methods of dimensioning and limiting, and the system now adopted enables the planner, ratefixer, and machine operator to complete their tasks without any reference to assembly drawings or drawing office. Experience has shown that the little extra time spent in preparing drawings to this style is amply compensated for in time saved.

EXPANDING ELECTRIC GENERATING CAPACITY.—In connection with the programme of expansion of electric generating capacity in Great Britain, Dorman, Long & Co. Ltd. is supplying the structural steelwork and other materials for three new power stations, and for extensions to thirteen existing power stations. Many of these extensions will mean an increase of double or treble the existing capacity. Approximately 35,000 tons of structural steelwork alone is involved in the contracts, which total about £2,000,000. The new power stations are at Meaford (Stoke-on-Trent), Staythorpe (Newark), and Birkenhead. Extensions to power stations which the company has on hand include Nottingham, West Ham, Huddersfield, Ferrybridge, Bradford, Stourport, Littlebrook (Kent), Fulham, Thornhill (Dewsbury), Hayle, Earley, Rotherham, and Dunston.

SHELL CHEMICALS LIMITED.—The name of Technical Products Limited has been changed to Shell Chemicals Limited. The address remains the same (112, Strand, London, W.C.2).

New Covered Fish-Vans, L.M.S.R.

Vehicles designed and built at Wolverton for passenger-train working



THE L.M.S.R. fleet of vehicles is being increased by the building of fifty covered fish-vans. The new vans, designed for passenger-train working and painted in L.M.S.R. standard coaching-stock colours, are 31 ft. long over headstocks and body ends, are mounted on six wheels, and have a 21-ft. wheelbase. The underframe of riveted steel and the timber body conform generally to L.M.S.R. standards.

The hardwood framing is mounted directly on the steel underframe, and sheathed inside and out with softwood tongued and grooved boards for side ends and roof. The roof is supported by steel carlines with timber packings, and finished on the outer surface with roofing canvas bedded in jointing compound. The timber floor is covered with composition laid to fall towards drains along the centre line of the vehicle. The interior of the walls and roof is protected by varnish. Access to the interior is by four sliding doors each 5 ft. wide; the doors as well as the body sides are covered inside and out with tongued and grooved boards. The van is thus surrounded by air space cavities which give a measure of thermal insulation; there is no ventilation.

The vehicles are fitted with the automatic vacuum brake; one 18 in. combined cylinder operates blocks on both sides of all wheels, and hand-brake levers are fitted on both sides, also operating on all wheels. The wheels are 3 ft. 7½ in. dia. with axle journals 9 in. × 4¾ in. dia. in plain-bearing axleboxes. Suspension is through rubber auxiliary bearing springs and 5 ft. laminated-steel springs, and these in combination with the long wheelbase are expected to give good running. As the vehicles are designed for passenger working, the buffers are of L.M.S.R. standard shock-absorbing type with rubber springs; the drawgear is also of the passenger-vehicle type and is screw-coupled non-continuous with intermediate drawbars passing through main transoms approximately 7 ft. behind each headstock, and terminating in rubber springs. Below are the principal dimensions:—

	Inside	Outside
Length	30 ft. 5 in.	31 ft. over headstocks 34 ft. 8 in. over buffers
Width	7 ft. 5 in.	8 ft. 8½ in. overall
Height from floor at centre	7 ft. 5½ in.	
Height from floor at sides	6 ft. 5¾ in. approx.	
Height from rail at centre	—	12 ft. 1 in.
Height from rail at cornice	—	11 ft. 0½ in.
Tare weight ...	17 tons	
Load	6 tons	

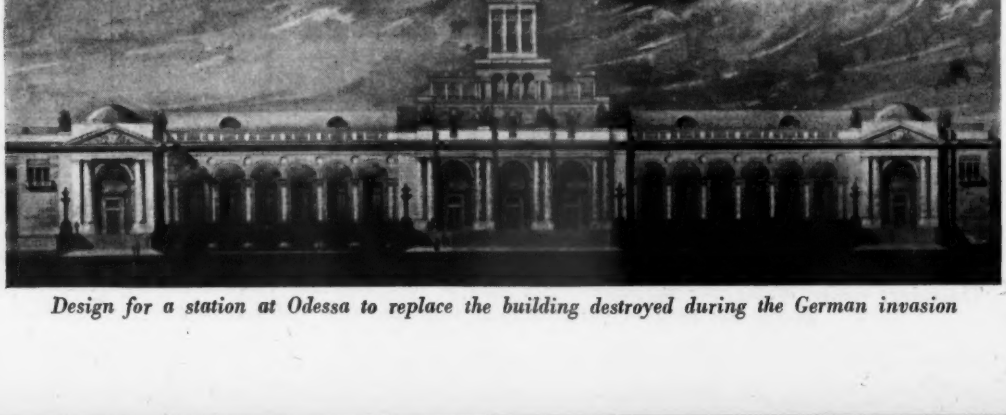
Streamline Bedroom-Buffet-Lounge Coach, C.N.R.

The lounge section of this new streamline coach built by the Canadian National Railways, described in our February 14 issue, contains a writing desk and a library

Designs for Russian Railway Stations

Design for an imposing new railway station at Kiev

An impression of the new railway station proposed for Kursk



Design for a station at Odessa to replace the building destroyed during the German invasion

RAILWAY NEWS SECTION

PERSONAL

Mr. G. H. Skelton, Assistant Accountant of the L.N.E.R., retired on April 5.

Sir Archibald McKinstry (Deputy-Chairman of Babcock & Wilcox Limited) has been appointed a member of the Royal Commission on Awards to Inventors, in place of Lt.-Colonel Sir John Greenly (Chairman of Babcock & Wilcox Limited), who has resigned.

Mr. E. J. Buckton has retired from partnership in the firm of Rendel, Palmer & Tritton, and Mr. R. Strick takes over the duties of Senior Partner. Mr. Buckton, however, is joining the firm's group of consultants.

Mr. W. P. Bradbury, Chief Commercial Manager, and Mr. A. J. Pearson, Assistant to President, L.M.S.R., have left for New York and a business tour of the U.S.A. They expect to return early next month.

Mr. Walter Patmore, Assistant to the Publicity Officer, L.P.T.B., has retired, after 34 years in the poster section of the Underground group and London Transport.

Sir Philip Warter, Adviser to the Board of Trade on Trading Estates, has relinquished the post because of the pressure of his own business.

Mr. William T. Faricy, Vice-President & General Counsel, Chicago & North Western Railway, has been elected President of the Association of American Railroads, in which capacity he succeeds Mr. R. V. Fletcher, who has served since the death last November of Mr. J. J. Pelley with the understanding that he was to be relieved as soon as a successor could be chosen.

G.W.R. APPOINTMENTS

Mr. A. G. Roberts, Assistant to Stores Superintendent, Swindon, to be Principal Assistant to Stores Superintendent, Swindon.

Mr. C. J. B. Manning, Solicitor Assistant, Paddington, to be Senior Solicitor Assistant, Paddington.

Mr. R. J. Slade, Assistant District Goods Manager, Bristol, to be Assistant District Goods Manager, Cardiff.

Mr. G. A. V. Phillips, Goods Agent, Smithfield, to be Assistant District Goods Manager, Bristol.

Mr. A. Shoemack, Goods Agent, Brentford, to be Goods Agent, Smithfield.

Mr. R. F. Foley, Assistant Goods Agent, Birkenhead, to be Goods Agent, Brentford.

Mr. G. Weaver, Goods Agent, Newport, to be Goods Agent, Wolverhampton.

Mr. H. S. Jenkins, Chief Outdoor Representative, Chief Goods Manager's Office, Paddington, to be Goods Agent, Newport.

Mr. E. Havers, Goods Agent, Birkenhead, to be Assistant Development Agent, Chief Goods Manager's Office, Paddington.

Mr. E. J. Smout, Chief Clerk, District Goods Manager's Office, Swansea, to be Goods Agent, Birkenhead.

Mr. K. C. Bakhle, B.Sc.(Eng.), at present Controller of Stores, Great Indian Peninsula Railway, who will succeed Sir George Cuffe as General Manager of the Bombay, Baroda & Central India Railway, when the latter proceeds on retiring leave early next month, was born at Karachi in 1898. He was educated in England at Dulwich College and at London University, graduating with honours as B.Sc. (Engineering). After a pupilage under Colonel H. F. Stephens on construction of the North Devon & Cornwall Junction Railway during 1923, he joined the Great Indian Peninsula Railway as an Assistant Engineer, and was concerned with the Bombay suburban electrification. In 1925 Mr. Bakhle was appointed Resident Engineer in charge of maintenance on the Bombay Sub-Division, and in 1928 he became Liaison Officer for the staff of the mechanical workshops at Parel and Matunga (Bombay). He was appointed Resident Engineer in charge of construction in the Bombay Sub-Division in 1929, and from 1930-32 was Assistant Deputy-Agent, Works. He was subsequently Assistant Executive Engineer on re-girdering of bridges. In 1934 he was transferred to the Bhopal Sub-Division, and during 1935 served as Personal Assistant to the Chief Transportation Superintendent. After holding various posts in the Engineering Department, Mr. Bakhle became, in 1938, Divisional Engineer, Nagpur, and later in that year was appointed Secretary of the Indian Pacific Locomotive Committee. Since his return to the G.I.P.R. he has held the following appointments: Divisional Engineer (1939-41); Officiating Deputy Chief Engineer (1941-42); Deputy General Manager (1942-43); Deputy Chief Engineer, Maintenance (1943-44); Officer on Special Duty with the Railway Board, on post-war reconstruction (1944); Officiating Chief Engineer, G.I.P.R. (1944); Deputy Chief Engineer, Construction (1945-46). Mr. Bakhle became Controller of Stores last year.

Mr. K. C. Bakhle

Appointed General Manager, Bombay, Baroda & Central India Railway

INDIAN RAILWAY STAFF CHANGES

The Governor-General has nominated Dr. John Matthai as a member of the Standing Finance Committee for Railways, of which he will also be Chairman.

Mr. B. B. Varma, on return from leave, has resumed as Director, Establishment, Railway Board. Mr. M. J. Chughtai, who was officiating for Mr. Varma, has become Joint Director, Establishment.

Mr. A. R. Edington, on return from leave, has resumed as Director, Stores, Railway Board.

Rai Bahadur A. Bholanath, Chief Commercial Manager, B.A.R., has been granted 28 months' leave preparatory to retirement as from August 16 last.

Mr. J. N. E. Nagle, Chief Transportation Manager, B.A.R., has been granted 26½ months' leave preparatory to retirement as from October 7 last. Mr. P. L. Roy has been appointed to officiate as Chief Transportation Manager.

Sir Harold Hartley, Chairman of British European Airways Corporation, has been appointed Chairman of the British Overseas Airways Corporation in succession to Lord Knollys. Mr. Gerard d'Erlanger, Chief Executive of B.E.A.C., has been appointed Chairman. The Parliamentary Secretary of the Ministry of Civil Aviation recently stated that on January 28 of this year the annual salaries of the Chairmen were: B.O.A.C., £7,500; B.E.A.C., £6,500; British South American Airways Corporation, £6,000; and that the Chairmen received annual expenses respectively of £2,000, £1,000, and £500. Sir Harold Hartley has resigned the post of Honorary Adviser on Home Produced Fuels in the Ministry of Fuel & Power, and the Chairmanship of the Fuel Research Board of the Department of Scientific & Industrial Research; Sir Harold Brown succeeds him as Chairman of the Fuel Research Board.

We regret to record the death of Mr. F. R. Reid, Secretary of the Irish & English Traffic Conference since 1937.

Mr. F. H. Petty, M.I.Loco.E., District Locomotive Superintendent, York, L.N.E.R., who, as recorded in our February 7 issue, has been appointed Assistant Locomotive Running Superintendent, North Eastern Area, was educated at Rossall School, and joined the G.N.R. as a premium apprentice at Doncaster Works in 1922. After holding various appointments in the Locomotive Running Department, he was selected in May, 1935, for

Mr. F. H. Petty

Appointed Assistant Locomotive Running Superintendent, N.E. Area, L.N.E.R.

Elliott [*& Fry*

Mr. George Caster

Appointed Mechanical Engineer, Gorton, L.N.E.R.

Mr. R. L. Vereker

Appointed District Locomotive Superintendent, Ardsley, L.N.E.R.

special training in the Operating and Commercial Departments, and in the next December was appointed to Whitby in charge of all departments at Whitby Town and West Cliff Stations, including Whitby locomotive shed. He was made Assistant District Locomotive Superintendent at Leeds in December, 1936, and at York in November, 1937. In October, 1938, Mr. Petty became Technical Assistant to Locomotive Running Superintendent, York, and, in July, 1939, Assistant Locomotive Running Superintendent, Scottish Area. In September, 1939, he was mobilised, and in February, 1945, while on active service, was appointed District Locomotive Superintendent, York, the duties of which position he returned to take up in November, 1945. During the recent war Mr. Petty, who had been commissioned in the R.E. (S.R.) in 1929, saw service in France and elsewhere, and eventually was posted to the British Army staff in Washington as head of the Transportation Branch, with the rank of Colonel and the title of Deputy-Director of Transportation. He was mentioned in despatches for services in France in 1940.

Mr. George Caster, B.Sc.(Eng.), A.M.I.C.E., A.M.I.Mech.E., Locomotive Works Manager, Gorton, L.N.E.R., who, as recorded in our February 7 issue, has been appointed Mechanical Engineer, Gorton, entered G.E.R. service at Stratford Works in 1903, under the late Mr. James Holden, and, after passing through the locomotive shops and drawing office, and graduating at London University as B.Sc. (Engineering) (Honours), was appointed a Technical Assistant to the Works Manager in 1910, remaining in that capacity until called up for military service in the Honourable Artillery Company on the outbreak of war in 1914. After subsequently taking a commission as a technical officer in the Army Ordnance Department to deal with inspection and maintenance of artillery and other matters in various parts of the line on the Western Front, and being promoted Major in 1917, he was demobilised in 1919, being transferred to the Reserve of Officers. Mr. Caster then returned to Stratford, and, after two years in charge of a then new self-contained repair shop for locomotives, was appointed Assistant Locomotive, Carriage & Wagon Works Manager in 1921. He was made Locomotive Works Manager, Gateshead, in 1930; Carriage & Wagon Works Manager, Gorton, in 1941; and Locomotive Works Manager, Gorton, in 1943.

Mr. R. L. Vereker, M.I.Loco.E., Locomotive Shedmaster, Mexborough, L.N.E.R., who, as recorded in our March 14 issue, has been appointed District Locomotive Superintendent, Ardsley, was educated at Trent College, and received technical education at the Royal College of Science, Dublin. He became a premium apprentice at Doncaster Works, Great Northern Railway, and afterwards was a pupil under the late Sir Nigel Gresley. Mr. Vereker was appointed in charge of Copley Hill sheds, Leeds, in 1913. He joined H.M. Forces in 1914, and, after four years' active service, was appointed, in 1919, Assistant District Locomotive Superintendent, Doncaster. In 1923 he became Assistant to the Works Manager, Doncaster, and in 1944 was appointed Shedmaster, Mexborough.

L.M.S.R. Staff Changes

Mr. V. B. Jones, District Veterinary Surgeon, Camden, to be District Veterinary Surgeon & Horse Superintendent, St. Pancras.

Mr. W. Swarbrick, Assistant District Passenger Manager, Birmingham, to be Assistant District Passenger Manager, Manchester.

Mr. L. W. Noton, Passenger Assistant to the District Goods & Passenger Manager, Sheffield, to be Assistant District Passenger Manager, Birmingham.

Mr. A. L. Owen, Engineering Assistant, Chief Civil Engineer's Department, Watford H.Q., to be Assistant to District Engineer, Bradford.

Mr. S. J. Symes, Assistant District Controller, Leicester, to be Passenger Assistant to District Goods & Passenger Manager, Stoke.

Mr. J. Turner, Chief Staff Clerk, District Goods & Passenger Manager's Office, Sheffield, to be Goods Agent, Sheffield (Wicker).

Mr. B. Audsley, Goods Agent, Bradford (Bridge Street), to be Goods Agent, Bradford (Valley).

Mr. E. Steele, Chief Claims Clerk, District Goods Manager's Office, Leeds, to be Goods Agent, Bradford (Bridge Street).

Mr. J. E. Pilling, Chief Claims Clerk, District Goods Manager's Office, Bolton, to be Goods Agent, Bury.

Mr. W. F. Holden, Goods Agent, Trafford Park, to be Goods Agent, Chester.

Mr. F. Evans, Railway Service Representative, District Goods Manager's Office, Manchester, to be Goods Agent, Trafford Park.

Mr. C. S. Spencer, Chief Transit & Station Working Clerk, District Goods Manager's Office, Bolton, to be Goods Agent, Burnley.

Mr. C. P. Chatham, Head of Section (Parcels), Chief Operating Manager's Office, Watford H.Q., to be Deputy Parcels Agent, London (Euston & St. Pancras).

Mr. W. A. Wild, Running Shed Foreman, Crewe (S), to be Assistant District Locomotive Superintendent, Wellingborough.

Mr. P. B. Crowther, Stationmaster & Goods Agent, Matlock, to be Stationmaster & Goods Agent, Bacup.

We regret to record the death on March 29, at the age of 73, of Mr. Lewis Cecil Geach, who retired in 1927 from the position of Superintendent of Motive Power, Midland Division, L.M.S.R.

Southern Railway Staff Changes

Mr. W. Barwell to be Chief of Outdoor Section, Hotels & Catering.

Mr. H. Thomas to be Chief of General Section, Hotels & Catering.

Mr. R. D. Steele to be Assistant to Superintendent of Motive Power.

Mr. J. Watson to be Assistant Divisional Superintendent of Motive Power, Western Division.

Mr. F. L. Howard, to be Assistant Divisional Superintendent of Motive Power, Eastern Division.

Mr. F. H. Marshall to be London District Freight Superintendent, *vice* Mr. E. E. Young, retiring.

Mr. R. Cogger to be Assistant to Signal Engineer.

Institution of Railway Signal Engineers

Paper and discussion on glass manufacture

At a meeting of the Institution of Railway Signal Engineers, in London, on December 18, with the President, Mr. H. H. Dyer, in the chair, Mr. J. G. Holmes, B.Sc., A.R.C.S., of Holophane Limited, read a paper on glass manufacture, with special reference to railway signalling requirements.

The paper covered the composition, manufacture, and properties of glass; the principles of the refraction, reflection, and absorption of light; the characteristics of coloured glass, signal spectacles, and lenses; together with the applications of various types of lenses, reflectors, and indicating lamps. The speaker showed a number of lantern slides and samples of glass, lenses, and other products.

Mr. E. Badham, in the course of opening the discussion, spoke about experiments made with a light signal unit set out in the open for 12 months and then examined with the intention of ascertaining the loss of light occasioned by the accumulation of dirt. The total loss had been 48.5 per cent., although the signal had been in a clean atmosphere. The outside of the lens had accounted for 31 per cent., the inside—although practically sealed up—for some 12 per cent., and the remainder had been caused in other ways.

Mr. J. E. Candler referred to the use of glass boxes for enclosing the operating parts of relays and the disadvantages of the present moulded designs. The glass was too easily fractured, rendering a relay scrap, and at times not sufficiently transparent. He thought toughened glass would be an improvement, as well as polishing after moulding. A high refractive index with signal lenses meant a better product. Absorption would be less, but perhaps on the whole the use of that type of glass would not in practice be worth while.

Mr. R. P. Quelch said that signal engineers did not ordinarily have much knowledge of glass beyond the finished article. At one time there had been much dissatisfaction on his railway with the bull's-eye lenses, and he had had to investigate the matter. The lenses had been of the old spherical form, and finally he had calculated a new one of elliptical type. A template had been made which, he was interested to see, conformed substantially to some figures in the paper, and eventually they had produced something for trial.

Polishing had been a problem in those days, and another trouble had been that the glass adhered to the mould and came away in a pitted condition. They had had to heat the lens again very carefully to get rid of that, and the process was rather critical and difficult to effect. There was risk of spoiling the focus. Better moulds were fortunately now available.

First Searchlight Signal

Mr. T. Austin gave some experiences with the first searchlight signal tested about 23 years ago on the G.C.R. at Willesden Green, when the yellow light, obtained from glass made under an American specification, had been so dark that there had been risk of its being taken for red under certain atmospheric conditions; and Mr. A. F. Bound, the Signal Engineer, had feared that the reverse might occur and a red signal be passed in error. He had asked, therefore, that a "daffodil" yellow glass should be obtained, and, without scientific figures to guide them, they had got something very near to the yellow glass now adopted in this country, quite distinct from the orange hue standard in the U.S.A.

Mr. C. A. Morton was interested in the question of street lighting, where much higher-powered lights were used than in railway signalling. He referred to the effects of dirt on the Fresnel type stepped lenses and the protective devices used in street equipment, where dirt was a factor to be reckoned with. He hoped they cleaned their glasses, etc., more than once a year. There were limitations to the shape of the Fresnel lenses not always apparent to the user; the moulds had to allow the finished product to come out easily.

Dealing with aviation and road traffic lights, he had been struck with certain discrepancies; one shade of yellow ought to run through the whole field, and one green. He hoped the new specifications would result in greater uniformity.

Heat-Resisting Green Glass

Mr. A. Moss spoke of the difficulty in obtaining a suitable heat-resisting green glass for the small roundels used in searchlight signals, and asked whether that was the reason why American practice was to pre-crack roundels of that colour. He pointed out that differences between ordinary yellow lenses were frequently great enough to make a marked distinction in the two lights when an extra yellow unit was added to a 3-aspect signal to make a fourth aspect.

Mr. F. Horler thought that, while the searchlight signal was satisfactory on long straight track, it left something to be desired on curved sections, especially in open country, where a good view was as important on curves as on the straight. Present methods of beam spread usually resulted in the signal being turned to bring the centre of the beam in mid-distance and, of course, available to the driver only momentarily. He thought it would improve matters if a lens could be got to spread right or left only, as required, and not equally from the centre, giving the final approach to the signal through the main beam.

Genuine White Light

The President said that signal engineers were waiting for the opticians to produce a curved beam! They had to remember that in fog they wanted maximum intensity as they were coming up to the signal. The yellow glasses should be to light limits; they had complaints that the others tended to appear red. They had got a real white light—unlike any so-called white lights around—in the junction indicator, using a daylight blue screen glass in front of the lamps, which on his line were always gas-filled. That produced a genuine white light. They also used a particular form of flashed blue glass for certain stencil-type indicators. They had had to go to the Continent to get just what they wanted. Now they could not obtain it, and, unfortunately, stocks were used up.

Mr. J. G. Holmes replied to the points raised at considerable length and supplied many additional technical details, especially on the questions of beam intensity, colour variations and testing, and elimination of unwished-for effects with light signalling. It appeared from aviation work that pilots differed from engine drivers, as air signalling made use of a shade of green that was objected to on the railway.

The President moved a vote of thanks to the author for his very instructive address.

Features of a New Fork-Lift Truck

The latest method of handling materials is by fork-lift truck. This method, which has been in use for some years in the United States and is being increasingly used in this country, results in a big saving in man-hours, for the reason that only one man is required to work the truck and complete the operations of loading, unloading, transporting, and stacking.

Merlift truck carrying a load raised to a height of 9 ft.

In the Merlift truck, the stores to be handled are placed on dunnage strips or on open-ended wooden or steel trays known as pallets. The driver manipulates the truck, guiding the fork under the load, and then both forks and load are raised off the ground hydraulically and the forks tilted backwards. The driver then proceeds to the place where the load has to be deposited and lowers the load to the ground or stacks it to any height up to 9 ft. as required.

This truck, which is being made by the Moss Gear Co. Ltd., Tyburn, Birmingham, for the Mercury Truck & Tractor Co. Ltd., Gloucester, makers of works trucks and tractors and shunting tractors for the past 25 years, will be supplied in sizes to raise loads of 5,000, 6,000, or 7,000 lb., and experiments are being carried out which will result in an 8,000 lb. model being available in the near future.

The truck is fitted with a four-cylinder four-stroke engine developing 46 b.h.p. at 2,000 r.p.m., which has a Moss gearbox giving two speeds forward and two in reverse, and the brakes are on the front driving wheels for operating either by hand or by foot. The steering axle is at the rear and is so designed that the vehicle can turn in just over its own length. The chassis frame is of the box type and of strong steel construction to prevent distortion. The Merlift has a road speed up to 10 m.p.h. forward or in reverse.

Staff and Labour Matters

Signalmen : Time Allowances on Changing Over

The Chairman of the Railway Staff National Tribunal recently found against a claim by the N.U.R. that signalmen in cabins in class 3 and upwards should be granted a time allowance of ten minutes before taking charge, to enable them to become conversant with traffic movements, for perusing notices, and for exchange of information with the signalmen they relieved.

The N.U.R. contended, among other matters, that the companies' rules and regulations (rules 75, 77, and 205) imposed obligations on signalmen as to the duties during changing over; and that, as no time allowance was provided for the performance of those duties, at all continuously-worked boxes and at boxes where men were booked to change over without any overlap, service was rendered for which no recompense was allowed.

The railway companies contended that, while a short overlap was inevitable when signalmen changed over, it was only exceptionally that as long as ten minutes was required; that the daily performance of the same duties enabled signalmen rapidly to appreciate the position on taking over; and that in practice the period of overlap rarely exceeded five minutes, a proportion of which time was occupied by the signalman relieved in preparing himself for his journey home.

They further contended that action in conformity with rule 75 under normal conditions occupied a very short period; that it is not part of a signalman's regular duties to act in accordance with rules 77 and 205, which related to abnormal circumstances; that an overlap of time was common to all grades whose responsibilities devolved on colleagues who relieved them; and that there was no more justification for fixing a time allowance to cover the change-over in the case of signalmen than for many other grades whose duties required a short overlap at the change-over.

English Electric Co. Ltd.

The annual general meeting of the English Electric Co. Ltd. was held in London on March 27, Sir George H. Nelson, Chairman & Managing Director of the company, presiding.

The Chairman, in moving the adoption of the report and accounts, referred to the meeting of July 16, 1946, at which the increase of the authorised capital of the company to £6,500,000, and the purchase of the whole of the share capital of Marconi's Wireless Telegraph Company, were approved. These operations had been completed, and their company's facilities and activities had been extended considerably as a result.

Dealing with the economic situation and the coal and power crisis, the Chairman said he hoped that all stockholders and employees had studied the White Paper issued by the Government. Too many had lived for too long on slogans and superstitions, such as the slogan "more pay for less work," and the superstition that there existed vast untapped sources of wealth which could be diverted at will from one section to another. Such illusions the White Paper dispelled with cold impartiality.

The task and actions disclosed as necessary in the White Paper must be the basis of the company's long-term economic strategy. They had achieved much success in assisting the drive for export by obtaining contracts from abroad for capital goods, and their uncompleted order book, both in volume and value, was higher than it had ever been.

On the assurance that additional labour and a balanced flow of materials would be available, the company had embarked on important extensions to its works, and had raised substantial new capital to pay for them. In carrying out this programme, however, many delays and disappointments had been met. Efforts to obtain labour from the Government in the last twelve months had resulted in an addition of under 300 men, whereas several thousands were required to increase the company's output of heavy machinery. Similar difficulties were experienced in obtaining allocations of standard materials.

The company learned, without previous warning and late on a Friday afternoon, of the Government's decision to cut off power from an area which included five of the seven main works of their group. They could obtain no information at any level in Government departments when power would be restored. It had been necessary to give notice to employees who could not be retained in productive work during the crisis, but they were indeed glad that they had now withdrawn the notice and were returning to normal conditions. The consequence of this enforced break in production even now could not easily be measured. The Chairman added that the electricity industry was in no way to blame, either on the supply or the manufacturing side, for the shortage of power plant.

The report and accounts were adopted, and a final dividend on the ordinary stock of 6 per cent. was approved, making 10 per cent. for the year.

L.N.E.R. Commercial School at Darlington

The main object of the L.N.E.R. Commercial School, Faverdale Hall, Darlington, the official opening of which by Sir Ronald Matthews, Chairman, L.N.E.R., on May 7, 1946, was reported in our issue of May 17 last, is to provide courses of instruction in the more advanced stages of railway commercial work. Each course lasts 4½ weeks.

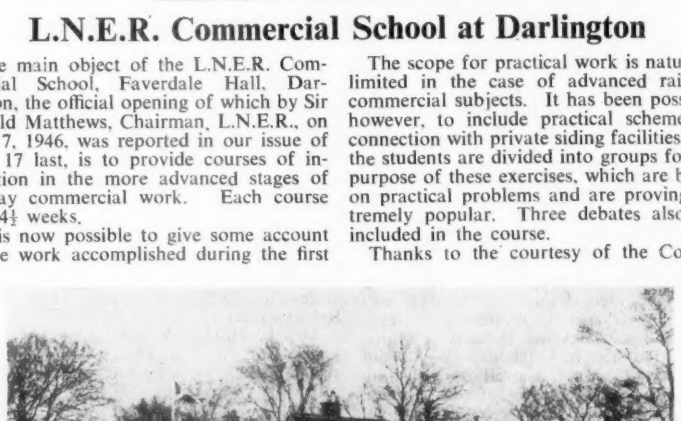
It is now possible to give some account of the work accomplished during the first year. Briefly, the lectures have covered the historical development of railways, their organisation and relationship with the Government and with other forms of transport, public relations, and the requirements of various branches of industry and trade, including coal, iron and steel, agriculture, and imports and exports. Other goods subjects taken include rates and the road-rail problem, goods terminal working and cartage services, freight train services and traffic regulations, freight rolling stock, demurrage, claims, and private siding schemes.

Lectures on the passenger side covered public requirements in relation to different types of service, the working of large passenger stations, passenger road transport, station amenities, merchandise by passenger-train rates, claims, rates, fares, etc. Subjects of general interest include office methods and the selection and training of staff. Time is allowed for discussion.

The scope for practical work is naturally limited in the case of advanced railway commercial subjects. It has been possible, however, to include practical schemes in connection with private siding facilities, and the students are divided into groups for the purpose of these exercises, which are based on practical problems and are proving extremely popular. Three debates also are included in the course.

Thanks to the courtesy of the Consett Iron Company and the Ashington & Horden Collieries (now the Ashington & Horden Units of the National Coal Board), it has been possible for students to visit a colliery, and the iron and steel works at Consett. Visits have been made, also, to selected goods depots and passenger stations, where students have seen the practical application of the principles covered by the lectures.

Several written tests are set, and one day at the end of the course is devoted to examinations. The results, taken with the general standard attained by the student, afford a reasonably reliable basis for assessment of ability. Before the end of a course, which caters for 20 students, each student is asked to submit to the Principal, Mr. H. F. Sanderson, his views on the arrangements at the school, and on the last day a general discussion on the working of the course takes place.



L.N.E.R. Commercial School, Faverdale Hall, Darlington

The Transport Bill in Standing Committee

Pensions schemes discussed: Remaining clauses guillotined: Compensation to wagon owners

When the Standing Committee of the House of Commons dealing with the Transport Bill resumed its deliberations on Tuesday, April 1, there were several references to the intention to conclude the committee stage by the following night.

Members dealt, first, with clauses relating to pensions of employees of undertakings to be taken over by the Transport Commission, to which Mr. Alfred Barnes (Minister of Transport) had put down a number of amendments.

Mr. Barnes said that these amendments would ensure that employees of the railways and other concerns would not suffer any diminution of existing pension rights and would enable road transport and other services to be brought under a comprehensive pensions scheme.

The amendments were agreed to without a division.

When, later, clauses were considered dealing with compensation to workmen who suffered loss of employment or pension rights, Mr. Barnes moved another amendment saying that, as a result of further consideration, the Government had decided that the conditions of compensation should be expressed more widely than in the original Bill, so as to deal with cases of worsening conditions under which an employee suffered hardship without direct pecuniary loss.

Mr. Ralph Assheton (City of London—C.) complained that the Committee had not been given sufficient time to study the effects of the statement. He added: "This shows that the working of the guillotine is not only intolerable, but is a complete negation of democracy."

The clause as amended by Mr. Barnes was agreed to without a division.

Encouragement to Employees

Mr. David T. Jones (The Hartlepools—Lab.) said that railway employees had a contribution to make to the efficient management of the railway industry. No one expected the Commission to go down to each little wayside station to discuss what improvements could be made, and if the railwaymen had ideas to put forward, they should be discussed at the lowest level in the negotiating machinery of the industry.

The discussion produced a compliment to the railway managements from Mr. E. Popplewell (Newcastle West—Lab.) for their encouragement to employees.

Sir George Harvie Watt (Richmond—C.) welcomed such a "pleasant tribute" and said that for a long time past the railway companies had done all they could to help and encourage members of their staffs to put forward new ideas.

Mr. Barnes accepted an amendment moved by Mr. Percy Morris (Swansea West—Lab.) urging the establishment and maintenance of negotiating machinery, and the encouragement and promotion of measures, designed to secure discussion of matters affecting the safety, health, and welfare of persons employed by the Transport Commission.

Brigadier O. L. Prior-Palmer (Worthing—C.) moved an amendment to give statutory protection to employees of the Road Hauliers' Association and the National Road Transport Federation. These two bodies, he said, were as vital to the road haulage industry as was the Railway Clearing House to the railway transport industry.

Mr. G. R. Strauss (Parliamentary Secretary to the Ministry of Transport), resisting the amendment, said that the two organisations were not transport services at all, but were employers' organisations.

When Opposition members asserted that the organisations were analogous to the Railway Clearing House, Mr. Strauss agreed, but said that the Railway Clearing House was a direct transport service; it was a separate organisation, but served the different railway companies.

The amendment was defeated.

At the evening sitting, Sir David Maxwell Fyfe (West Derby, Liverpool—C.) sought to amend the Bill to provide that persons appealing to the Arbitration Tribunal should have the costs of their appeals borne by the State.

In moving his amendment, Sir David said that it provided for the rejection by the Tribunal of any claim for costs, which would safeguard the Transport Commission from frivolous appeals. He maintained that, when a man was having his business expropriated by the State, it seemed unreasonable that he should have to bear any part of the costs of any action he might take to save his business.

Mr. Alfred Barnes, in resisting the amendment, said that approximately 2,000 road haulage undertakings would be taken over by the Transport Commission. He considered that the amendment, if incorporated in the Bill, would be an invitation to everybody concerned to lodge a case against the Commission. The time taken and the costs involved would make the whole matter most unprofitable.

The provision made was to leave the matter to the absolute discretion of the Tribunal; and that, he thought, was the wisest thing to do. The circumstances of the various companies to be taken over would differ greatly, and this would be borne in mind.

The amendment was defeated.

The Committee then proceeded to deal at high speed with the remaining clauses, and there was no discussion under the guillotine procedure, each of the remaining clauses being agreed to on a division.

Privately-Owned Wagons

When the Committee resumed on April 2, all 127 clauses of the original Bill had been dealt with, except for three postponed clauses.

Introducing the postponed clauses, which dealt with compensation to be paid for the taking over of privately-owned wagons, Mr. G. R. Strauss said that the only controversy was about the compensation to be paid. There were about 585,000 privately-owned wagons altogether, and most of them were exceedingly old, two-thirds being over 30 years old, and one-third, 45 years. The age of the wagons had been one of the greatest handicaps in recent years in transporting coal and other materials.

Said Mr. Strauss: "The Transport Commission, when it takes over, will have to undertake very great wagon-building activities. The Minister has already ordered 50,000 new steel wagons."

On the question of compensation, Mr. Strauss said that the Government had been able to arrive at a basis which the wagon owners considered reasonable, and were prepared to accept.

The three postponed clauses were agreed to without a division.

Several Government supporters had put their names to a new clause which sought to change the regulations dealing with the unrestricted carriage of goods by road by private undertakings using their own vehicles.

The proposed new clause was moved by Mr. Ernest Davies (Enfield—Lab.), and sought to impose conditions on persons who, after the appointed day under the Bill, applied to the licensing authority for a "C" licence, or a "B" licence. Mr. Davies said that existing holders of "C" licences would not be affected, but new applicants should have to justify their needs before the licensing authority.

Sir Arthur Salter (Oxford University—Ind.) opposed the clause on the ground that one effect would be that "C" licence holders would be slowly eliminated.

Mr. Douglas Jay (Battersea, N.—Lab.) hoped that the Government would reject the clause and thought the Minister was right in dropping the previous clauses relating to "C" licences.

Mr. David T. Jones (The Hartlepools—Lab.) contended that the proposed clause would provide for an impartial examination of all applications to ensure that there was no overloading of the system.

Mr. W. Monslow (Barrow-in-Furness—Lab.) described the clause as "a suicidal policy and the very negation of justice."

A Controversial Issue

Mr. Alfred Barnes, resisting the clause, said he was not surprised that it reflected a division of opinion, because it was his experience that the problem of "C" licences was a controversial issue in almost all discussions. When he made his statement withdrawing the clauses affecting "C" licence holders he made it quite plain that there must be no abuse of the provision.

Mr. Davies declined to withdraw the clause, but did not force the issue to a division, and the clause was then rejected.

At the evening session, Opposition amendments to the second schedule of the Bill were considered which sought to provide that executives set up under the Transport Commission to deal with harbours or inland waterways should include at least one member with wide experience in the administration of these branches.

The amendments were resisted by Mr. Barnes in the ground that, if he were driven to meeting sectional interests in appointing executives, the whole thing would break down. The interests of transport, he said, were so wide and varied that it was impossible to meet the desires of all branches.

The amendments were defeated.

The Hon. J. S. Maclay (Montrose—Lib. Nat.) was unable owing to the introduction of the guillotine procedure to state his case for an amendment to the sixth schedule of the Bill. This amendment proposed that any power or duty of the Minister in relation to the administration of harbours should be the subject of a public inquiry.

This concluded the committee stage of the Bill, which will now be reported to the House for its third reading.

Tributes were paid to the Chairman, Sir Charles MacAndrew, for his conduct of the proceedings during the 31 sittings of the Committee, and Sir David Maxwell Fyfe further commended the personal qualities of the Minister of Transport and his Parliamentary Secretary, although, he said, the introduction of the guillotine on certain important discussions would always remain to members of the Opposition "a blot on the fair name of Parliamentary procedure."

Questions in Parliament

Heavy Repairs to Locomotives

Major W. T. Wells (Walsall—Lab.) on February 12 asked the Chancellor of the Duchy of Lancaster whether the Krupps works, Essen, were being used for the manufacture of railway engines.

Mr. J. B. Hynd (Chancellor of the Duchy of Lancaster), in a written answer, stated: No. These works have been instructed to concentrate on heavy repairs to locomotives.

Railway Temporary Employees

Mr. J. A. Sparks (Acton—Lab.) on February 13 asked the Minister of Transport if he would state the number of railway employees, excluding shopmen, who were temporarily employed; and what proportion they bore to the total employed.

Mr. Alfred Barnes (Minister of Transport) stated: In December, 1946, there were 110,313 railway employees, excluding shopmen, who were temporarily employed. At that time, the total number of staff employed, also excluding shopmen, was approximately 550,000.

Coal Traffic on Railways

Mr. J. A. Sparks (Acton—Lab.) on March 17 asked the Minister of Transport if he would state the tonnage of coal moved from pitheads and colliery sidings by the main-line railway companies for each week in 1947, to the nearest convenient date, and show the tonnage for Sundays separately.

Mr. G. R. Strauss (Parliamentary Secretary to the Minister of Transport) in a written answer stated: Tonnage of coal moved each week during the present year was:—

Week ended	Tons
January 3	2,306,150
January 10	2,740,540
January 17	2,825,860
January 24	2,782,330
January 31	2,677,100
February 7	2,481,110
February 14	2,757,380
February 21	2,966,550
February 28	2,783,000
March 7 ... (provisional)	2,748,720

Tonnage cleared from collieries on Sundays before February 16 is not available. Clearances since then have been:—

Date	Tons
February 16	427,900
February 23	411,230
March 2	402,990
March 9	491,060

Railway Clerks' Claims

Mr. C. Osborne (Louth—C.) on February 18 asked the Chancellor of the Exchequer if he was aware that the Railway Clerks' Association was now demanding a 35-hour week with £1 increase in wages; and what would be the effect of granting that concession on the purchasing power of the £.

Dr. H. Dalton (Chancellor of the Exchequer): No such calculation can be made.

Mr. Osborne: In view of the great need for increased output, would the Chancellor call the attention of the trade union leaders to the unpatriotic demand at the present time for a 35-hour week?

Dr. Dalton: We must not cross the wires. That is a matter primarily for the Minister of Labour. At the moment, of course, it is a hypothetical question.

Mr. A. Edward Davies (Burslem—Lab.): Is the Minister aware that the unattractive conditions in the railway industry account for the large number of men leaving the service at a time when they are vitally necessary to the transport system and to the country?

Dr. Dalton did not reply.

Mr. C. Osborne on February 20 asked the Minister of Labour if the Railway Clerks' Association had been represented at the National Joint Advisory Council meeting which issued the statement in Cmd. No. 7018; and if he would make a statement on the Association's demands for a 35-hour week and £1 wage increase.

Mr. George Isaacs (Minister of Labour): The statement to which Mr. Osborne refers was issued by the Government, but with the endorsement of both sides of the National Joint Advisory Council, which consist respectively of members representing the Trade Union Congress and the British Employers' Confederation. The answer to the second part of the question is: No.

Mr. Osborne: Does the Minister think that in our present economic crisis the country can afford a 35-hour week?

Mr. Isaacs: It is not a matter of what I think (cries of "Oh"). If negotiations are going on between a trade union and employers it would be quite wrong for the Minister of Labour, who ultimately may be called on to negotiate between the two parties, to say what he thinks.

Mr. Percy Morris (Swansea West—Lab.): Will the Minister inform the House that the claim represents an effort to introduce order where chaos now prevails, and is in respect of the hours of employment of clerical and administrative workers in the railway services of this country, which have resulted in huge withdrawals from the services?

Mr. Isaacs did not reply.

Canal Traffic

Mr. W. McAdam (Salford North—Lab.) on March 17 asked the Minister of Transport how many of the 34 canals owned by the railway companies were in active use.

Mr. George Strauss in a written answer stated: I am informed that commercial traffic normally passes along the whole or portions of 20 of the canals in Great Britain owned by the railway companies. The tonnage which passed in 1946 was 516,522.

Efficient Working of Railways

Mr. P. Piratin (Stepney, Mile End—Comm.) on March 17 asked the Minister of Transport what steps were being taken to ensure that, between now and the day of transfer of the railways to the nation, the railway companies carried out the measures necessary to ensure the efficient working of the railways; and the carrying out of necessary repairs to locomotive sheds and engines and other vital matters.

Mr. George Strauss stated in a written answer: The railways are still under the control of the Minister of Transport and he is satisfied that the companies are taking all practicable steps to maintain the efficiency of their undertakings.

Railway Crossings Accidents near Bicester

Squadron-Leader Sir Gifford Fox (Henley—C.) on February 18 asked the Secretary of State for War why Service railway trains had crashed through the level crossing gates across the public highway at Arncott Depot, near Bicester, four times in the last few months; what was wrong with the signalling system; what was the total cost of the damage; whether any persons had been injured or killed; and what steps had been taken to stop that recurring.

Major John Freeman (Financial Secretary to the War Office), in a written answer, stated: I understand that there have been three accidents in the last six months at the five road crossings in this depot. In one case a train hit a gate that had not been properly closed and damage to the extent of £2 was caused. In the second incident an engine and wagon hit a utility truck which ignored a signal at the crossing and was damaged beyond repair; the cost was £167. One officer and one other rank in the truck were slightly injured. In the third accident some wagons got out of control during shunting operations and hit the crossing gates, damaging them to the extent of £2. The rule regarding unprotected crossings is that the engine must stop dead unless signalled over the road by an authorised person. Gates, however, are now installed at four of the crossings and are being hung at the fifth.

Rail Traffic Congestion

Mr. P. Piratin (Stepney, Mile End—Comm.) on February 24 asked the Minister of Transport whether he had now received the report of the investigation by the railway company into the case brought to his attention by him (Mr. Piratin) of a train consisting of 75 mineral wagons which had stood with steam up for 11 hours 10 minutes on December 5-6; and if he would make a statement.

Mr. Alfred Barnes, in a written answer, stated: Yes. The railway company advise me after investigation that, in the conditions of congestion which prevailed on the day in question, to have taken any other course would have resulted in greater interference with traffic movement.

Railway Worker's Appointment

Sir Waldron Smithers (Orpington—C.) on March 12 asked the Secretary of State for the Colonies if he would state the name and qualifications for the post of the railway worker who had been appointed to the Labour Department of the Government of Kenya.

Mr. A. Creech Jones: The name of the officer is Mr. James Patrick. In the course of a wide experience in the trades union and co-operative movements and in local government, Mr. Patrick has been an Honorary Secretary to an important branch of the Railway Clerks' Association for 15 years; Secretary of a trades and labour council for 6 years; and Chairman of the Western Division of the Railway Clerks' Association in Scotland. He has acted as Secretary of a branch of the Co-operative Society for 15 years and during the war has served on many committees and tribunals on manpower questions.

Sir Waldron Smithers: In view of the obvious political bias behind this, will not the Minister find someone better known who will carry more weight?

Mr. Creech Jones did not reply.

Housing Accommodation for Railway Staff

Sir Ralph Glyn (Abingdon—C.) on February 17 asked the Minister of Transport what steps had been taken to provide housing accommodation in London for main-line railway operating staff requiring to be transferred from the provinces to meet the deficiency of staff in the London area.

Mr. Alfred Barnes: The responsibility for providing special accommodation, where necessary, for workers transferred by an employer, rests in the first instance on the employer himself. In view, however, of the special position of the railway companies, I have arranged for them to be kept informed of any suitable premises becoming available in those parts of London where their chief needs arise, and I am hopeful of obtaining the release of accommodation for this purpose, and will let Sir Ralph Glyn know the result.

Sir Ralph Glyn: Is the Minister aware

that under present conditions it is essential to keep suburban lines open, and that at the present moment it is almost impossible to find accommodation for the extra staff?

Mr. Barnes: Yes; I am very well aware of that. Steps are being taken as far as possible to meet that difficulty.

Mr. J. A. Sparks (Acton—Lab.): Is not the Minister aware that the railway companies have land available, owned by their garden village societies, which could be used for temporary and permanent accommodation? Will he make representations to them accordingly?

Mr. Barnes: In London?

Mr. Sparks: Yes.

Railway Companies' Dwellings

Mr. W. McAdam (Salford North—Lab.) on March 7 asked the Minister of Transport how many dwelling houses were owned by the four main-line railway companies in England, Scotland, and Wales; how many of those houses were at present let for rent; and how many of the houses had no bathroom or hot water provided.

Mr. Alfred Barnes in a written answer stated: I am informed that the four main-line railway companies own 52,584 houses, which, with the exception of a few which are either disused or used for storage or similar purposes, are let for rent. The number of these that are without bathrooms or hot water systems is not available, and its compilation would involve an amount of inquiry and clerical work which I should not feel justified in asking the companies to undertake.

Packed Meals for Railwaymen

Mr. J. A. Sparks (Acton—Lab.) on February 19 asked the Minister of Transport if he was aware that the packed-meal service for railwaymen sleeping in railway coaches and hostels because of the shortage of accommodation at Old Oak Common, Newbury, Westbury (Wiltshire), Didcot, Oxford, and Gloucester was not equivalent to a main meal; and, in view of the arduous nature of the duties of those men who worked varied hours by day and night, if he would take steps to see that they received something more substantial than jam and cheese sandwiches when unable to take a hot meal in their respective canteens.

Mr. George Strauss (Parliamentary Secretary to the Ministry of Transport), in a written answer, stated: Packed meals are for consumption on duty and consist of cheese or jam sandwiches, or, when available, fish or meat sandwiches. Full hot meals are available for the men before and after their turns of duty.

Railway Staff Hostels

Mr. J. A. Sparks (Acton—Lab.) on February 17 asked the Minister of Transport if he was aware of the large number of transferred railwaymen at Old Oak Common, Newbury, Westbury (Wiltshire), Didcot, Oxford, and Gloucester who were unable to obtain living accommodation and had to sleep in railway coaches; and what steps the Great Western Railway was taking through its garden village societies to build houses for those men on available land or otherwise to provide proper hostel accommodation.

Mr. Alfred Barnes: I am informed that staff hostels have been provided in Newbury, Didcot, Oxford, and Gloucester, and that no railwaymen are sleeping in coaches in those places. At Old Oak Common and Westbury (Wiltshire), where a number of railwaymen are accommodated in suitably adapted coaches, the building of staff hostels is in hand. The railway company is negotiating with a number of local authorities regarding the erection of houses for its employees.

Mr. Sparks: Is the Minister aware that the Great Western Railway Garden Village Society has land available at Ealing and Hayes which could well be used to provide some temporary accommodation for these men, who have nowhere else to sleep than in railway coaches?

Mr. Barnes: I observe that this is the second time on which Mr. Sparks has referred to this matter. I will look into it, but I could not make any commitment at the moment.

Mr. I. Mikardo (Reading—Lab.): Is the Minister satisfied that these transfers are really necessary, and, in particular, is he aware that, today, 18 firemen are being transferred from Reading to points outside the London Division of the G.W.R., in spite of the fact that there is a desperate shortage of firemen in the London Division?

Mr. Barnes: I know that it is essential to make railway staff as mobile as possible.

Jamaican Railway Loss

Mr. L. D. Gammans (Hornsey—C.) on February 19 asked the Secretary of State for the Colonies what was the loss on the Jamaica nationalised railway for the latest period for which figures were available; if that loss included amortisation on capital or was only an operating loss; and what had been the total loss on that railway since it had been acquired by the Jamaica Government.

Mr. A. Creech Jones (Secretary of State for the Colonies): The operating loss for the financial year ended March 31, 1946, was £128,000, not including interest and redemption charges amounting over that period to £99,700. The accumulated loss since the Jamaica Government acquired the railway in 1900 up to the end of the current year will, it is estimated, be approximately £5,500,000.

Mr. Gammans: Will the Minister pass those figures to the Minister of Transport, in order that they may be of some use to him in his advocacy of the nationalisation of transport?

Mr. Creech Jones: It was because of the hopelessness of private enterprise that the Jamaica Government took over.

British Holdings in Brazilian Railways

Colonel O. E. Crosthwaite-Eyre (New Forest & Christchurch—C.) on March 4 asked the Chancellor of the Exchequer under what terms His Majesty's Government had agreed to the purchase by the Brazilian Government of British holdings in Brazilian railways; what was the total purchase price; and in what currency would the purchase price be paid.

Dr. Hugh Dalton in a written answer stated: The properties of the San Paulo Railway Company in Brazil are being purchased, in accordance with the terms of its concession, by the Brazilian Government for £6,639,000. The company is in negotiation with the Brazilian Government over an additional claim.

Public Relations Officers

Mr. H. W. Butcher (Holland with Boston—Lib. Nat.) on February 3 asked the Financial Secretary to the Treasury if he would state the number of persons in all Government departments, respectively, employed as public relations officers and Press officers; the total number in each respective department; and the annual cost.

Mr. Glenvil Hall (Financial Secretary to the Treasury) supplied the following information in a written answer: The following table gives for all departments, other than the Central Office of Information, the particulars to which I referred in my reply on January 21. The figures cover all staff in the information sections of the departments concerned, other than subordinate clerical and typing staff:—

	Home		Staff overseas or wholly engaged in this country on producing material for use overseas	
	Numbers	Cost	Numbers	Cost
		£		£
Admiralty	16	11,761	—	—
Ministry of Agriculture and Fisheries (*a*)	5	3,335	—	—
Air Ministry (*b*)	17	13,653	10	9,480
Ministry of Civil Aviation	6	4,070	—	—
Colonial Office	11	9,801	8	7,388
Control Office for Germany & Austria	12	6,268	93 (*c*)	43,440
Dominions Office	8	5,568	19	20,348
10, Downing Street	1	2,000	—	—
Ministry of Education	5	2,885	—	—
Ministry of Food	33	18,711	—	—
Foreign Office	11	10,300	588	515,200
Forestry Commission	1	1,000	—	—
Ministry of Fuel & Power	9	5,804	—	—
Ministry of Health	12	8,302	—	—
Home Office	5	3,897	—	—
India Office	8	6,896	11 (*e*)	13,785
Inland Revenue (*d*)	2	1,450	—	—
Ministry of National Insurance	3	2,482	—	—
Ministry of Labour	24	16,600	—	—
National Savings Committee (*d*)	14	10,037	—	—
Ministry of Pensions	1	1,105	—	—
Post Office	25	17,000	—	—
Scottish Home Department	13	8,460	—	—
Department of Scientific & Industrial Research	1	750	—	—
Ministry of Supply	18	12,889	—	—
Ministry of Town & Country Planning	4	2,845	—	—
Board of Trade	12	9,056	8	6,837
Ministry of Transport	6	4,968	—	—
Treasury	2	1,790	—	—
War Damage Commission	1	1,000	—	—
War Office	40	31,253	35	21,530
Ministry of Works	6	4,524	—	—
	332	240,460	772	638,008

(*a*) The staff employed on advising farmers on the best methods of food production are not included

(*b*) The staff of the photographic dark room and R.A.F. film production unit are not included; they are partly employed on information work, but this varies with operational requirements, and no estimate can be made of the cost

(*c*) This staff is largely engaged on re-education of Germans and Austrians

(*d*) Includes one part-time post

(*e*) Includes one officer in Burma

Notes and News

South African Railway Earnings.—Railway earnings in South Africa for the period February 2 to March 1 amounted to £4,793,811, compared with £4,221,184 in the previous corresponding period.

King's College Engineering Society Centenary.—The Engineering Society of King's College, London, celebrates this year the centenary of its foundation. It is claimed to be the oldest students' engineering society in the world.

Re-Opening of L.M.S.R. Welcombe Hotel, Stratford-on-Avon.—The Welcombe Hotel of the L.M.S.R. at Stratford-on-Avon, which had been requisitioned in 1939, was re-opened on April 3. The telephone number of the hotel is now Stratford-on-Avon 3611.

Superintendent of the Line Required.—A Superintendent of the Line, age 40 to 45 years, is required by the Government of Palestine for the railway department for three years, with prospect of permanency. Candidates must have had experience in traffic operation, particularly in intensive seasonal traffics and port clearance. See Official Notices on page 375.

Southern Railway Cross-Channel Service for Cars.—On April 1 the Southern Railway restored the cross-Channel motorcar transport service by ss. *Autocarrier* between Folkestone Harbour and Boulogne. The service will leave Folkestone at 11.30 a.m. from April 13 to June 30, returning from Boulogne at 4 p.m., and making the crossing in 2 hr. Accommodation is provided for 24 cars and 104 passengers accompanying cars.

Aluminium Wire & Cable Development.—The Aluminium Wire & Cable Co. Ltd., which was formed recently by the British Aluminium Co. Ltd., Hawker Siddeley Aircraft Co. Ltd., and Tube Investments Limited, has arranged to purchase premises at Port Tennant, Swansea, from the Ministry of Supply, and will occupy these premises as from May 1. Modifications to buildings and the installation of plant will be carried out as soon as possible, and it is anticipated that some production will start towards the end of the year. The Aluminium Wire & Cable Co. Ltd. has offices, temporarily, at Salisbury House, Circus Place, London Wall, London, E.C.2.

Assistant to District Railway Engineer (Civil) Required.—An assistant to District Railway Engineer (Civil) is required by Coras Iompair Eireann (Irish Transport Company). Candidates must be A.M.I.C.E. or A.M.I.C.E.I. or hold a civil engineering degree, and must have had five years' experience of railway permanent way and works maintenance. See Official Notices on page 375.

Mineral Railway Project in Canada.—The Hollinger North Shore Exploration Company, which has been granted exploration and mineral rights in the Ungava district by the Quebec Legislature, has applied to the Canadian Parliament for a charter to build a railway. The application was made under the name of the Quebec, North Shore & Labrador Railway Company.

King's Lynn Docks & Railway Company.—The report and accounts of the company for the year ended December 31, 1946, are presented again in a condensed form. Net revenue amounted to £5,845, as against £5,928, and the appropriation from the railways compensation account (Railways Act, 1921) is £850, compared with £750 in 1945. After paying interest on the 4½ per cent. debenture stock, a balance of £19 13s. 2d. is carried forward, as against £29 13s. 8d. brought in from the previous year.

Institute of Welding: North London Branch.—A sound film illustrating the principles embodied in Babcock & Wilcox water-tube boiler design and operation, together with details of construction and manufacture, was shown at a recent meeting of the North London Branch of the Institute of Welding. Over 70 members attended the meeting, which was held at the South West Essex Technical College, Walthamstow, London, E., and which was presided over by the Chairman, Mr. S. P. Bennett. At the conclusion of the meeting, Mr. L. C. Percival, Vice-Chairman, proposed a vote of thanks to Dr. Harris, who had introduced the film and answered a number of questions put by members.

Air Services to Northern Ireland.—A revised timetable providing five services daily between Scotland and Belfast was introduced by British European Airways on March 31. Four westbound and three

Coal-Train Accident in Snowstorm

The scene at Bassaleg, G.W.R., after a coal train had run into a stationary engine and van in a heavy snowstorm during the bad weather early in March

British and Irish Railway Stocks and Shares

Stocks	Highest 1946	Lowest 1946	Prices Apr. 8, 1947	Prices Rise Fall
G.W.R.				
Cons. Ord.	61½	54½	54½	—
5% Con. Pref. ...	126½	107	120½	+ 1
5% Red. Pref. (1950)	106½	102½	10	—
5% Rt. Charge ...	140½	122½	134½	—
5% Cons. Guar. ...	137½	118½	131½	—
4% Deb.	129½	106	123½	—
4½% Deb.	129½	107	123½	—
4½% Deb.	130½	114	125½	—
5% Deb.	142½	125	137½	—
2½% Deb.	95½	81½	92½	—
L.M.S.R.				
Ord.	30½	26½	27½	—
4% Pref. (1923) ...	64	52½	59½	+ 1
4% Pref.	86	75½	80½	—
5% Red. Pref. (1955)	105½	97	101½	—
5% Guar.	108½	100	102½	—
4% Deb.	120	103	113½	—
5% Red. Deb. (1952)	108½	105½	105½	—
L.N.E.R.				
5% Pref. Ord. ...	7	5	6⅜	—
Def. Ord.	3½	2½	3½	—
4% First Pref. ...	59½	50½	54½	—
4% Second Pref. ...	29½	25⅜	27	+ ⅛
5% Red. Pref. (1955)	104	97	98½	—
4% First Guar. ...	107	98	101½	—
4% Second Guar. ...	101	90	95½	—
3% Deb.	104	87½	98	—
4% Deb.	119½	102½	113½	—
4½% Sinking Fund Red. Deb. ...	107½	101½	103½	—
SOUTHERN				
Pref. Ord.	79½	70	73½	—
Def. Ord.	24	19½	22½	—
5% Pref.	125½	107	119½	+ 1
5% Red. Pref. (1964)	115½	106½	111½	—
5% Guar. Pref. ...	137½	119	131½	—
5% Red. Guar. Pref. (1957)	115½	107½	111½	—
4% Deb	129½	105½	123½	—
5% Deb.	159½	125½	134½	—
4% Red. Deb. (1962-67)	113½	104½	110½	—
4% Red. Deb. (1970-80)	115½	104½	111½	—
FORTH BRIDGE				
4% Deb.	109	103	103½	—
4% Guar.	105	102	99½	—
L.P.T.B.				
4½ "A"	133½	120½	127½	+ 1
5% "A"	142½	130½	136½	—
3% Guar. (1967-72) ...	108	98½	104½	—
5% "B"	128½	117½	123½	—
"C"	64½	56½	62½	—
MERSEY				
Ord.	34	30	33½	—
3% Perp. Pref. ...	76	69	72½	—
4% Perp. Deb. ...	117½	103	111	—
3% Perp. Deb. ...	98	81	92½	—
IRELAND*				
BELFAST & C.D.				
Ord.	8½	6	7½	—
G. NORTHERN				
Ord.	41⅞	30½	31½	—
Pref.	63⅜	52	50½	— 1½
Guar.	97½	78½	90	—
Deb.	107	97½	104½	—
IRISH TRANSPORT				
Common	19/2½	16/9	15/–	—
3% Deb.	107	100	104½	— ½

* Latest available quotation

OFFICIAL NOTICES

For Sale

MOVING HEAD PLANO-GRINDER made by Snow & Co. Ltd., of Sheffield, in 1938. The fixed work table will take work up to 60 ft. long, 18 in. wide and 12 in. deep. The horizontal eight-segment grinding wheel is 26 in. diameter and direct-coupled to a 40-h.p. motor. A 5-h.p. motor operates the wheel head traverse to which is attached a travelling carriage for the operator. The machine is complete with motors, starter and push-button controls for operation on 590/630-volt D.C. supply.

Apply to PURCHASING AGENT, L.P.T.B., 55, Broadway, S.W.1 (ABBey 1234; Extension 312).

CORAS IOMPAIR EIREANN require Assistant to District Railway Engineer (Civil). Permanent appointment. Pensionable. Salary £450 by £20 per annum to £630. Must be A.M.I.C.E. or A.M.I.C.E.I., or hold Civil Engineering Degree, and must have five years' experience railway permanent way and works maintenance. Applicants, who will be required to attend for personal interview, should apply in writing, giving full particulars to: CHIEF ENGINEER, CORAS IOMPAIR EIREANN, Westland Row Station, Dublin.

RAILWAY AMALGAMATION IN GREAT BRITAIN. By W. E. Simnett. An authoritative account of the course of railway amalgamation in Great Britain up to the end of 1923. Cloth. 8½ in. by 5½ in. 276 pp. 15*s*. *By post* 15*s*. 7*d*.

RAILWAY MAINTENANCE PROBLEMS. By H. A. Hull (late District Engineer, L.M.S.R.). Valuable information. With much sound advice upon the upkeep of permanent way. Cloth, 8¼ in. by 5½ in. 82 pp. Diagrams. 5*s*. *By post* 5*s*. 3*d*.

RAILWAY STORE METHODS. By W. H. Jarvis. Great Western Railway. The necessity for training officers—Organisation of stores department—Stores accounts. Cloth. 7½ in. by 5 in. 116 pp. With diagrams. 4*s*. *By post* 4*s*. 3*d*.

Crown Agents for the Colonies

APPLICATIONS from qualified candidates are invited for the following post:—

SUPERINTENDENT OF THE LINE required by the Government of Palestine for the Railway Department for three years, with prospect of permanency. Salary £P1,100 a year, plus expatriation allowance of £P200 a year and cost-of-living allowance of £P17.300 mils a month for a single man and between £P18.424 mils and £P20.846 mils for a married man, according to number of children (£P1 = 1,000 mils = £1). Free passages. Candidates, aged 40 to 45, must have had experience in traffic operation, particularly in intensive seasonal traffics and port clearance. They must have good organising ability and commercial sense, and be able to exercise tact and discretion in dealing with problems arising in the different countries in which sections of the Palestine Railway are operated and in handling staff of different nationalities. A knowledge of international working agreements governing rating and rolling stock control an advantage. Apply at once by letter, stating age, whether married or single, and full particulars of qualifications and experience, and mentioning this paper, to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting M/N/17843 on both letter and envelope.

FORDELL RAILWAY. The history of this Scottish Waggonway, now over 175 years old. 32 pp. art paper. 9½ in. × 7½ in. 33 postcard-size illustrations and folding map. Price 4s. 6d. post free, from DR. INGLIS, The Colony, Larbert, Stirlingshire.

STANDARD MILITARY RAILWAY BRIDGES. By F. S. Bond. A description of the different types of bridges designed for rapid erection in the field by the Allied Forces, and of the various methods employed in such erection. 28 pages. 9 in. by 12 in.; fully illustrated. Paper cover 5*s*. *By post* 5*s*. 2*d*.

Tools and Plant for Sale

WHEEL LATHE (Noble & Lund) in first class condition. 3-ft. 6-in. dia. face plates with wedge-type drivers and adjustable collets, capacity 3½ in.-3½ in. Height of centres 2 ft. Distance between face-place drivers 6 ft. 6 in.

The driving head is equipped with a 36-h.p. motor with push-button multi-speed electrical control gear, while the adjustable rear head is power traversed by a 7.5-h.p. motor. All electrical equipment is 460 v. D.C.

The slide rests are of clamp-type tool fixing and are equipped with ratchet feed.

The machine may be inspected at the Corporation Transport Works, Shrubhill, Leith Walk, Edinburgh, by arrangement, and offers for the machine (to be uplifted free of all charge to the Corporation) should be made to the Transport Manager, City of Edinburgh Transport Department, 2, St. James' Square, Edinburgh, not later than Wednesday, April 30, 1947.

BRITISH PATENT—Improved method for treating timber suitable for Railway Pads, etc. Outright patent sale. Application from principals only.—Reply Box 87, *The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

FIFTY YEARS OF RAILWAY LIFE IN ENGLAND AND SCOTLAND. By Joseph Tatlow. Cloth. 8½ in. by 7 in. 223 pp. Illustrated. 10*s*. *By post* 10*s*. 7*d*.

THE RAILWAY HANDBOOK provides the railway student with a collection of useful statistics and information relating to the railways of Great Britain and Ireland. In addition, in matters of international interest, such as speed and electrification progress, the book extends its scope to cover the whole world in order to present a complete picture of these increasingly-important developments. 120 pp. Dy. 8vo. Paper covers. *Price* 5*s*. *By post* 5*s*. 3*d*.

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eastbound services are to and from Glasgow (Renfrew Airport), and the remaining flights are between Belfast and Prestwick.

Twenty-Five Zones Operating in G.W.R. Goods Scheme.—The G.W.R. zonal scheme for expediting the transit of small consignments by goods train was extended on April 1 to Oxford, Weymouth, Gloucester, Hereford, and Haverfordwest. These five new zones, covering areas ranging from 500 to 1,000 square miles, bring the total in operation to 25. Ultimately, 36 zones will cover the whole of the G.W.R. system.

Oil-Driven Plant for Swindon Works, G.W.R.—The coal-fired steam plants in the Locomotive, Carriage & Wagon Works at Swindon, which consume some 31,000 tons of coal annually, are to be converted by the G.W.R. to oil burning. The steam supplied operates machinery used in the shops where locomotives, carriages, and wagons are constructed and repaired. It is expected that the work will be completed by the late autumn.

All L.N.E.R. Pre-War Steamship Services Restored.—All the pre-war L.N.E.R. steamship services now have been resumed, although not yet with the same frequency as formerly. The Harwich—Hook of Holland night service is being operated by the ss. *Prague*, soon to be joined by the ss. *Arnhem*, which has been constructed specially for the service by John Brown & Co. Ltd. The Harwich—Antwerp passenger and cargo service is being maintained by the ss. *Accrington* and *Dewsbury*, formerly engaged on the L.N.E.R. Grimsby—Hamburg service; and the cargo service between Harwich and Rotterdam is operated by the ss. *Sheringham* and ss. *Felixstowe*. In the course of the next few months, a new ferry steamer, the ss. *Suffolk Ferry*, will join the *Essex Ferry* on the Harwich—Zeebrugge train ferry. In addition to the L.N.E.R. Harwich services, those of the United Shipping Company, of Copenhagen, have resumed sailings between Harwich and Esbjerg; and the Zeeland Steamship Company, having for some months given assistance to the L.N.E.R. in the Hook of Holland night service, will in the near future re-establish the day service to and from Harwich.

Liverpool Overhead Railway.—Total receipts for the three months to March 30 were £34,268, a decrease of £3.718 compared with the preceding year. In the week ended March 30, the receipts were £2,668, as compared with £2,854 in the corresponding week of 1946.

Davenset Dramatic Society.—Employees of Partridge, Wilson Co. Ltd., at the Davenset Electrical Works, Leicester, recently devised and produced a musical fantasy entitled "Moonshine and the Magic Ring." The comedy was in three acts, with a cast of over forty; proceeds were in aid of the Leicester Royal Infirmary.

Skefco Ball Bearing Co. Ltd.—At a meeting of the directors of the Skefco Ball Bearing Co. Ltd. held on March 26, it was decided to recommend a final dividend of 7d. per stock unit of 5s., free of income tax, making 10d. per stock unit of 5s., free of income tax, for the year ended December 31, 1946. The net profit for 1946 amounted to £165,386, and there is available also £25,000, being income tax on initial allowances on purchases of new buildings and machinery. The net profit for 1945 was £130,916.

"Garage" Type Fuelling Stations for G.W.R. Oil Burners.—The G.W.R. has brought into use the first of fourteen additional oil storage plants which are being erected in connection with the Ministry of Fuel & Power scheme for the conversion of a number of locomotives for burning oil fuel. The new storage plant, situated at Swindon, has a total storage capacity of 36,000 gal., and is equipped with overhead filling arrangements of new design for the tender tanks. The plant was erected entirely by the company's own staff, and will provide oil for engines working from Swindon running shed, as well as for engines converted to oil burning in Swindon Works.

Flood Damage to G.W.R. Viaduct.—Early on March 29, the flood waters of the River Wye washed away part of the G.W.R. viaduct at Strangford, near Backney Halt, leaving the rails hanging 40 ft. above the river. The viaduct carries the single line between Hereford and Ross-on-Wye. A bus service was instituted between these points.

Relaying by Crane.—The work of laying pre-assembled track with a crane was described by Mr. A. W. Sheldon, Chief Civil Engineer's Department, Southern Railway, at the meeting of the London Section of the Permanent Way Institution, held at Reading, in the staff canteen of the Signal Department, G.W.R., on March 11. The lecture was illustrated with a series of lantern slides and a film, and gave rise to a considerable discussion on the problems involved.

West Yorkshire Road Car Co. Ltd.—Traffic receipts and other income, less operating, management, and general expenses, for the year ended December 31, 1946, were £395,607, as against £402,501 in the preceding year. After providing for fuel taxation and vehicle licences, income tax and E.P.T., and directors' fees, and placing £50,000 to general reserve, a net profit of £133,698 remains, as against £104,464 in 1945. The directors recommend a final dividend of 7 per cent., free of income tax, on the ordinary stock for 1946, making 12½ per cent. for the year. A balance of £81,225 is carried forward, as against £58,964 brought in.

Forthcoming Meetings

April 21 (*Mon.*).—The Permanent Way Institution (London Section). 6.30 p.m. "Permanent Way in Relation to Accidents," by Mr. H. Williams (L.M.S.R.).

Railway Stock Market

With the Budget due on Tuesday next, stock markets have been restrained in most directions, although the further rally in British Funds imparted a firm undertone generally and the Imperial Chemical results continued to influence leading industrial shares. British Funds were helped by the Chancellor's promise to include in his Budget statement a defence of the cheaper money policy. The latter, it is being assumed, may stimulate the gilt-edged rally (2½ per cent. Treasury Bonds are still four points below par, around which they were changing hands earlier in the year) and this would no doubt have a dominating influence on most other sections of markets.

On the other hand, the belief appears to be growing that, all points considered, a position is being reached where the cheaper money policy will have to be modified despite its important part in Government planning, particularly as to nationalisation compensation. Nevertheless, apart from the influence of any specific tax changes, it is being assumed that for the time being, at any rate, the course of British Funds is likely to continue to be the dominating market factor. Leading industrial shares therefore may be at least maintained in price, although, on the other hand, there are many indications that buying of industrials is becoming much more selective. It is recognised that fuel and other shortages must be affecting the earnings of many companies and that this will be reflected in results for the current year.

In some cases current trends may also influence dividend decisions which have yet to be made in respect of the past year. This applies more particularly to companies which are mainly dependent on the home market. Shares of companies with important overseas trade and interests appear to be in increasing favour. Iron and steel shares, such as Dorman Long, United Steel, etc., have been in better demand because of the good yields. Colvilles were higher on balance in view of the substantial increase in profits, although the dividend is again limited to 8 per cent. Vickers remained prominently active in front of the dividend announcement.

The rally in British Funds tended to emphasise the attractions of home rails with the latter still well below "take-over" prices. Buying, which was still said to be largely institutional, was confined mainly to debenture and other senior stocks, which in most cases have rallied from their recent set-back. These senior stocks are regarded as offering an attractive means of acquiring an interest in gilt-edged, based on calculations as to the current prices in relation to "take-over" levels and the dividend payments that will fall due before the ultimate exchange into British Transport stock. Nevertheless, a similar position exists in regard to the junior or ordinary stocks, some of which appear to be undervalued in relation to the debenture and other senior stocks. In fact, now the compensation terms and take-over prices are known, there is little distinction between the debenture and other senior stocks and the ordinary or junior stocks. All classes will be exchanged into the proposed British Transport stock, which it is still being confidently expected will carry interest at the rate of 2½ per cent. per annum.

An interesting feature has been demand for L.N.E.R. second preference stock, which compared with a week ago, has rallied from 26½ to 27. As was to be expected, Metropolitan Assented with a rise from 53½ to 56 has responded to official confirmation that under the guarantee, the dividend on this stock will be 3¼ per cent. until 1948, and 3 per cent. until 1958, after which it will be exchanged into British Transport stock. London Transport "C" has remained at 62.

There was again a good deal of business in South American rails, with Argentine stocks continuing to attract buyers in anticipation of the "share-out" terms in respect of the different classes of stocks. On the other hand, there have been considerable fluctuations in Brazilian railway stocks, Leopoldina and Great Western of Brazil moving back sharply on profit-taking, pending news of the progress of the acquisition talks. San Paulo, before easing slightly, rose to the new high level of 183 in anticipation of a cash offer for the ancillary assets. Compared with a week ago, Leopoldina has receded from 23 to 21½, the preference stock from 69 to 61½ and the debentures from 82½ to 77½. Among Argentine rails, movements were generally small, ordinary and preference tending to attract on any easing of prices, while steady demand was reported for debenture stocks of the leading companies. Elsewhere, Antofagasta receded from 16¼ to 15½, but the preference stock at 64 was unchanged on balance. Hopes of a new capital scheme were reflected by an improvement from 25 to 26 in United of Havana 1906 debentures.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open	Week ended	Traffic for week: Total this year	Traffic for week: Inc. or dec. compared with 1945/6	No. of Week	Aggregate traffics to date: Totals 1946/7	Aggregate traffics to date: Totals 1945/6	Aggregate traffics to date: Increase or decrease	Shares or Stock	Prices: Highest 1945	Prices: Lowest 1945	Prices: Apr. 8, 1947
				£	£		£	£	£				
South & Central America	Antofagasta	834	30.3.47	42,920	+ 3,830	13	485,830	436,680	+ 49,150	Ord. Stk.	12	8¾	15½
	Arg. N.E.	753	29.3.47	ps.360,500	+ps.86,800	39	ps.12,487,000	ps.11,523,000	+ ps.963,700	,,	10	5¾	16
	Bolivar	174	Feb., 1947	$113,608	+ $3,013	9	$228,677	$232,451	− $3,774	6 p.c. Deb.	8¼	5½	7½
	Brazil	—	—	—	—	—	—	—	—	Bonds	25	17	37
	B.A. Pacific	2,771	29.3.47	ps.2,980,000	+ps.498,000	39	ps.92,157,000	ps. 88,604,000	+ps.3,553,000	Ord. Stk.	7	5	10
	B.A.G.S.	5,080	29.3.47	ps.4,487,000	−ps. 74,000	39	ps.141,796,000	ps.138,530,000	+ ps.3,266.000	Ord. Stk.	13¾	10½	18
	B.A. Western	1,924	29.3.47	ps.1,547,000	+ps.394,000	39	ps.51,148,000	ps.46,852,000	+ ps.4,296,000	,,	12¾	9½	28
	Cent. Argentine	3,700	29.3.47	ps.3,381,745	−ps. 25,77›	39	ps.125,890,760	ps.123,025,677	+ ps.2,865,083	,,	9¾	7	20½
	Do.	—	—	—	—	—	—	—	—	Dfd.	5	2¾	17½
	Cent. Uruguay	970	29.3.47	47,619	+ 4,475	39	1,454,325	1,516,178	− 61,853	Ord. Stk.	7½	4	27½
	Costa Rica	262	Feb., 1947	30,030	+ 3,118	35	220,372	222,104	− 1,732	Stk.	16½	13	12½
	Dorada	70	Feb., 1947	29,600	+ 1,535	8	60,300	59,814	+ 486	1 Mt. Deb.	103	102	106½
	Entre Rios	808	29.3.47	ps.432,300	+ps. 4,300	39	ps.16,843,200	ps.16,595,900	+ ps.247,300	Ord. Stk.	7½	4¼	8½
	G.W. of Brazil	1,030	29.3.47	35,600	+ 5,800	13	493,700	411,800	+ 81,900	Ord. Stk.	30/-	23/6	97/6
	Inter. Ctl. Amer.	794	Feb., 1947	$1,145,853	+ $246,184	8	$2,327,261	$1,924,216	+ $403,045	—	—	—	—
	La Guaira	22¾	Mar., 1947	$130,008	+ $18,378	13	$355,075	$347,692	+ $7,383	5 p.c. Deb.	78	70	75
	Leopoldina	1,9 8	29.3.47	59,135	+ 3,080	13	812,067	726,817	+ 85,250	Ord. Stk.	4¼	3½	21½
	Mexican	483	31.5.46	ps.1,464,000	+ps.459,100	22	ps.7,706,200	ps.13,441,600	+ps.5,220,200	Ord. Stk.	¼	¼	1
	Midland Uruguay	319	Feb., 1947	7,529	− 6,268	34	132,490	148,286	− 15,796	—	—	—	—
	Nitrate	382	31.3.47	10,788	+ 1,285	13	49,326	57,202	− 7,876	Ord. Sh.	75/6	67/6	81/3
	N.W. of Uruguay	113	Feb., 1947	3,067	− 811	35	42,607	44,696	− 2,089	—	—	—	—
	Paraguay Cent.	274	28.3.47	G$56,.65	+ G$210	39	G$2,468,255	G$2,355,899	+ G$112,3$6	Pr.Li.Stk.	79⅞	77	60½
	Peru Corp.	1,059	Mar., 1947	155,079	+ 36,693	39	1,356,614	1,252,842	+ 103,772	Pref.	10⅜	7⅞	11½
	Salvador	100	Feb., 1947	c244,000	+ c11,000	35	c1,129,000	c1,080,000	+ c49,000	—	—	—	—
	San Paulo	153¼	—	—	—	—	—	—	—	Ord. Stk.	60¾	50½	179½
	Taltal	156	Feb., 1947	2,870	− 2,445	35	34,705	24,490	+ 10,215	Ord. Sh.	17/-	10/6	24/-
	United of Havana	1,301	29.3.47	105,403	+ 7,464	39	2,327,616	2,170,805	+ 156,811	Ord. Stk.	3	1	4
	Uruguay Northern	73	Feb., 1947	837	− 764	34	9,953	14,214	− 4,261	—	—	—	—
Canada	Canadian National	23,535	Feb., 1947	7,767,000	+ 553,250	8	15,981,500	14,939,000	+ 1,042,500	—	—	—	—
	Canadian Pacific	17,037	31.3.47	2,326,250	+ 349,250	13	17,837,250	17,790,250	+ 47,000	Ord. Stk.	24	14¾	17½
Various	Barsi Light†	202	Jan., 1947	21,292	− 1,492	43	225,870	225,120	+ 750	Ord. Stk.	131	123	106½
	Beira	204	Jan., 1947	86,519	+ 14,290	16	355,672	286,482	+ 69,190	—	—	—	—
	Egyptian Delta	607	28.2.47	13,965	+ 657	48	618,441	578,317	+ 40,124	Prf. Sh.	10	8½	6¼
	Manila	—	—	—	—	—	—	—	—	B. Deb.	71	55½	73½
	Mid. of W. Australia	277	Jan., 1947	16,229	− 1,557	30	115,351	118,260	− 2,909	Inc. Deb.	97¼	85	65
	Nigeria	1,900	Feb., 1947	353,073	+ 2,154	46	4,193,473	3,153,983	+ 1,039,490	—	—	—	—
	Rhodesia	2,445	Jan., 1947	557,398	+ 66,020	16	2,227,423	2,009,946	+ 217,457	—	—	—	—
	South African	13,323	8.3.47	1,292,031	+ 178,357	49	56,867,061	49,975,966	+ 6,891,095	—	—	—	—
	Victoria	4,774	Nov., 1946	1,204,525	− 39,782	—	—	—	—	—	—	—	—

† Receipts are calculated @ 1s. 6d. to the rupee